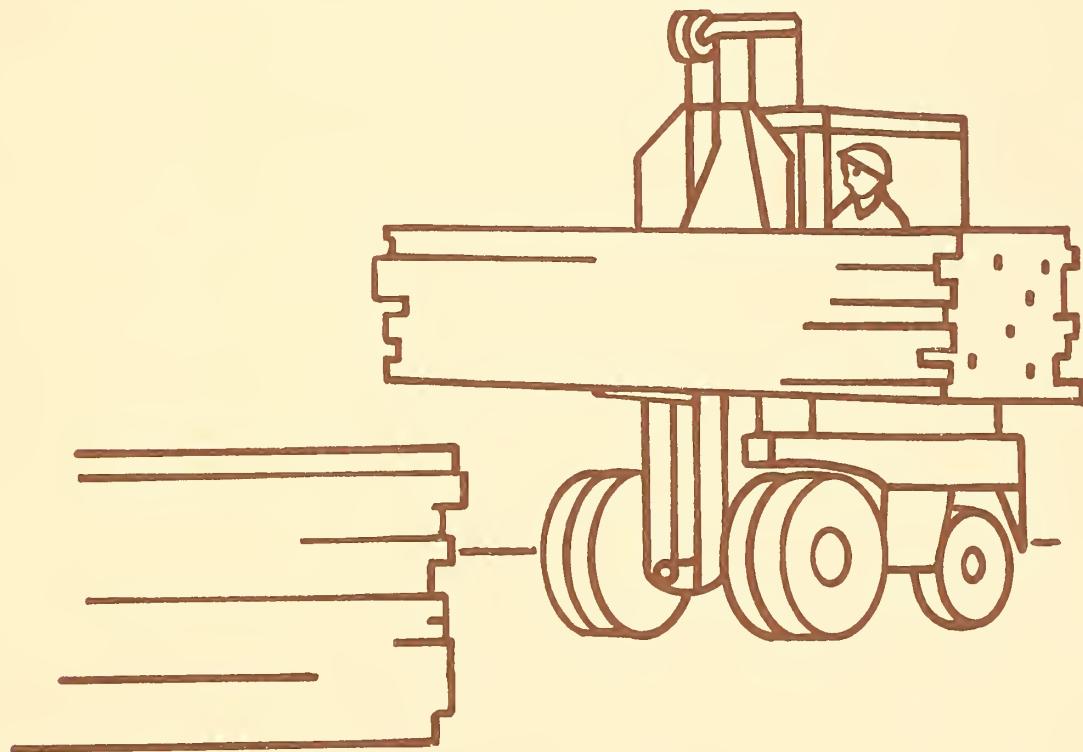


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EXPORT OPPORTUNITIES FOR VIETNAM TIMBER PRODUCTS IN JAPAN, KOREA, TAIWAN, AND SINGAPORE



International Development Center • Economic Research Service
U.S. Department of Agriculture cooperating with U.S. Agency for International Development and
the Vietnam Ministry of Agriculture and Land Development

ABSTRACT

Timber cut in Southeast Asia climbed dramatically in the 1960's and early 70's. Indications are that demand will continue to climb, exceeding the capacity of the major Southeast Asian exporting countries to meet it. Prospects of a tighter market situation for Southeast Asian hardwoods make this a favorable time to develop a timber export business in the Republic of Vietnam. The shift from a buyer's to a potential seller's market should also make it easier to build up domestic manufacturing of timber products for export; at present, Southeast Asian timber countries are exporting most of their timber in the form of logs. Principal timber importing countries have been Japan, Korea, Taiwan, and Singapore.

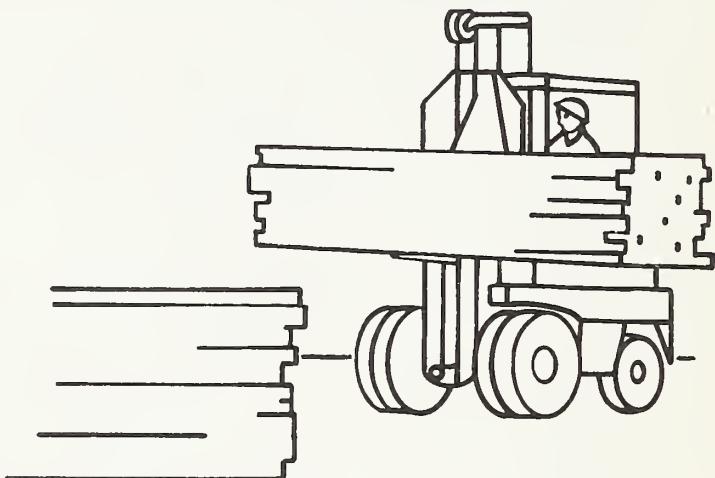
Keywords: Vietnam, Japan, Taiwan, Korea, Singapore, Southeast Asia, forestry products, foreign trade, developing country timber exports.

NOTE: Prices are quoted in U.S. dollars throughout the publication.

EXPORT OPPORTUNITIES FOR VIETNAM TIMBER PRODUCTS IN JAPAN, KOREA, TAIWAN, AND SINGAPORE

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PREFACE

The following report evaluates market prospects for Vietnamese timber products in Japan, Taiwan, Korea, and Singapore. This is one of a series of studies sponsored by USAID (U.S. Agency for International Development) and involving USDA (U.S. Department of Agriculture) and Government of Vietnam personnel to appraise export markets for Vietnamese agricultural, fishery, and forestry products. The timber market information provided here, coupled with additional studies of resource availability and production feasibility, will help officials plan and implement Vietnam's timber industry development and forestry programs. Ralph E. Holben, USAID project manager, Saigon, worked with Vietnamese officials to implement the timber marketing study. This study was done in 1972 and 1973.

This report is based on a substantial analysis of the timber supply-demand situation in Japan, a more limited review of Singapore's timber industries, and information obtained in brief visits to Taiwan and Korea. Many persons were most generous in assisting us obtain information and in giving freely of their own analyses of the situation; they are listed in the appendix. We are particularly grateful to the following:

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SUMMARY AND CONCLUSIONS

The outlook for developing an export timber market in Vietnam appears favorable. The market for Southeast Asian timber has been growing steadily and indications are that demands will continue to climb. This outlook arises from the worldwide growth in timber demand and the increasing difficulty in satisfying that demand.

The issue stands out most clearly in Japan. Timber use in that country has increased dramatically in the past decade and is expected to rise much higher, far outstripping the capacity of its own forests. Increasing dependence on wood imports and mounting difficulty in securing logs from other countries is causing concern in Japan--enough concern, in fact, to draw the attention of that country's cabinet ministers.

Information on the timber resource of Southeast Asia is extremely inadequate, but the indications are that excessively rapid forest liquidation, destructive slash-burn agriculture, unbalanced utilization of species, and minimal application of forestry principles will sooner or later reduce the production of high quality wood in that part of the world. It is a foregone conclusion that Malaysia, Philippines, and Indonesia cannot sustain the output of the kind and quality of timber they have been producing unless strong action is taken--and perhaps not even then.

It is this situation that encourages development of a Vietnamese timber export industry. The central issue at this juncture is how desirous and able South Vietnam is to avoid the path that the other Southeast Asian nations have followed and to adopt, instead, a program which not only provides immediate income and employment but assures a sustained and much greater contribution from the forests in the long run.

Aside from the problems involved in developing a desirable industrial structure, there are four very difficult problems to overcome:

- How to avoid shipping most Vietnamese timber as logs, with the manufacturing elsewhere. Korea, Taiwan, Singapore, and Hong Kong have developed profitable industries based on Southeast Asian logs. Japan has successfully sustained heavy imports of raw materials in lieu of manufactured products. The vested interest of these countries in log imports will not be easily overcome.
- How to avoid the uneven utilization that has characterized timber development elsewhere in the tropical countries. Only a few species have been fully utilized. This has resulted in increased costs, waste, deteriorated forests, and compounded forestry difficulties.

- How to make forestry efforts keep pace with timber utilization. Most timber development programs start with high aspirations for balancing forestry and utilization. Unfortunately, things never work out that way. Timber cutting generally equals expectations, but forestry languishes. Neglect of timber culture in the tropics is one way to assure diminishing income.
- How to avoid excessively-rapid liquidation of timber. Quick creaming of the best timber will reduce yields and income later. It will also reduce the possibility of ever achieving adequate forestry programs.

The possibility that South Vietnam can overcome these difficulties is greatly enhanced by recent developments. Japan, Taiwan, and the other countries dependent on Southeast Asian logs are beginning to worry about future wood supplies. As a result, they are developing a deeper interest and willingness to help tropical timber countries manage their forest resources. Furthermore, the timber shortage is giving the timber-producing countries a leverage they lacked previously; what was essentially a buyer's market is shifting to a seller's market.

These developments provide the opportunity for a sound long-range policy in South Vietnam. Timber marketing in Vietnam should not be a separate activity from resource utilization. Timber concessions for wood export can and should be made contingent upon specified performance in forestry, species utilization, and the development of local manufacturing facilities. If Vietnam can muster the purpose and leadership needed for a development program, it can probably get assistance from the countries that need its wood.

Any country with timber products to sell may look forward, with considerable assurance, to a rising outlet for logs, lumber, plywood, and veneer if it can meet the competitive requirements of world markets. Consumption of industrial wood (everything except fuelwood) has been steadily rising everywhere. Total world consumption of industrial wood (excluding fuelwood) climbed from 726 million cubic meters in 1950 to 1,166 million in 1967.^{1/} By 1985, the annual consumption may rise to 1,995 million cubic meters, almost three times the world consumption in 1950.^{2/}

No reliable figures are available on the capacity of the world's forests to produce; however, if timber demands increase as projected, there is little doubt that the world timber supply will at best be tight and at worst be critical with the present level (meaning quality) of timber management. Since timber is, for the most part, a long-term crop, it would be some years before upgrading of forest management could materially improve the outlook. The supply situation will undoubtedly be more favorable if better and more complete utilization is made of the trees actually cut, and there is reason for optimism that this will happen. While this would relieve the supply problem, it is not likely to remove it.

The era of timber shortage may already have started. During recent years Japan has been importing 12 to 16 percent of its logs and lumber from Canada and the United States. The current proposal by some to shut off these exports to Japan because of U.S. timber supply problems has created shock waves in Japan which testify to the great difficulty of finding adequate alternative sources of supply.

Takeuchi of the International Bank for Reconstruction and Development has projected the likely demand for tropical timber (table 1). World demand for tropical hardwoods (including fuelwood) in 1985 is expected to be four times higher than it was in 1955 and twice as high as in 1968. Much of the increase will be in Asia. Japan's mounting appetite for raw material plus the emerging needs of China and India alone can greatly increase the demand for tropical woods. Moreover, in contrast with the highly-selective U.S. and European demands for quality woods, much of the growing Asian market will undoubtedly be for the "bread and butter" products used in construction that are less demanding in terms of wood quality.

1/ S. L. Pringle. World Supply and Demand of Hardwoods. Conference on Tropical Hardwoods, Syracuse University. August 1969.

2/ Kenji Takeuchi. Tropical Hardwood Trade in the Asia-Pacific Region--Issues and Opportunities. Economic Staff Working Paper #136. International Bank for Reconstruction and Development. October 26, 1972.

Table 1.--Demand for tropical hardwood,
by major areas, selected years 1/

Unit: Million cubic meters (roundwood equivalent)

Major areas	Actual 2/				Projected			
	: 1955	: 1960	: 1965	: 1968	: 1975	: 1980	: 1985	
	:	:	:	:	:	:	:	
<u>Tropical producing areas</u>	:							
Tropical Africa	: 31.3	30.6	35.1	38.1	46.3	53.2	61.0	
Tropical Latin America	: 3.1	3.5	3.8	4.3	N.A.	N.A.	N.A.	
Tropical Asia	: 15.2	13.9	15.5	15.4	N.A.	N.A.	N.A.	
	: 13.0	13.2	15.9	18.4	N.A.	N.A.	N.A.	
<u>Importing areas 3/</u>	:							
Europe	: 7.3	14.2	22.8	33.2	54.5	69.5	83.1	
United States	: 3.5	6.2	8.4	10.0	12.0	13.0	14.0	
Japan	: 1.4	2.0	3.2	6.4	10.9	14.3	16.0	
Rest of the world	: 1.3	4.1	9.2	13.7	28.0	37.5	47.0	
	: 1.1	1.9	2.1	3.1	3.6	4.7	6.0	
<u>World total</u>	: 38.6	44.8	57.9	71.3	100.8	122.7	144.0	
	:							
	:							

1/ Regional figures may not add to totals because of rounding.

2/ Three-year averages, except for 1968.

3/ Consumption in all areas outside the tropical areas.

Source: Economic Staff Working Paper #136 by Kenji Takeuchi, International Bank for Reconstruction and Development, Washington, D.C. October 27, 1972.

While the Far East contains only about one-fifth of the tropical forest in the world, it is in an excellent position to share in this increased demand if it handles its timber resource properly. Table 2 shows that the Far East, despite its relatively small share of tropical forest, has 71 percent of the timber trade. This anomaly arises primarily from the nature of the forest itself. Tropical forests are characterized by an enormous number of tree species--there are literally thousands. However, the volume of currently marketable species per hectare tends to be greater in Southeast Asia than in Africa and the Americas. The economic feasibility of development is therefore greater also.

Table 2.--Proportion of tropical forest area and tropical hardwood exports in 1966, by major regions

Major regions	Percent of	Percent of
	hardwood forest	tropical hardwood
		exports, 1966
-- Percent --		
Americas	45	8
Africa	36	21
S.E. Asia	19	71
Total	100	100

Source: F. Bruce Lamb. "Tropical American Forest Resources," Proceedings, Conference on Tropical Hardwoods. Syracuse University. August 1969.

MARKET OUTLOOK FOR SOUTHEAST ASIAN LOGS

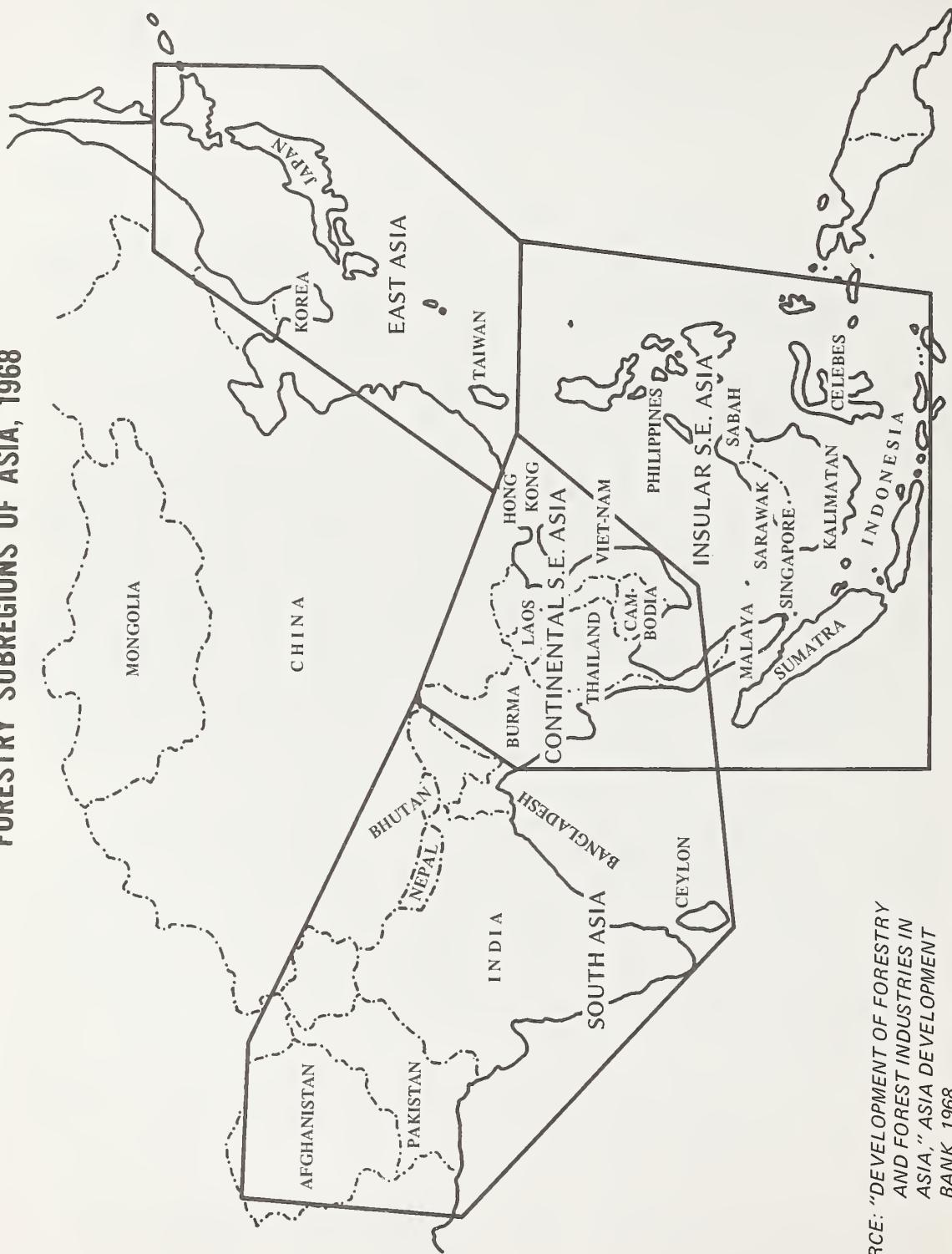
Demand for Logs

Competition for Far East hardwood logs has begun to intensify, and it is likely to become very sharp. The reason for this lies in the nature of timber industry development in recent years. Although the bulk of the hardwood timber resource lies in Insular Southeast Asia (figure 1), most of the manufacturing capacity is in East Asia, primarily Japan, Korea, and Taiwan. According to the Asian Development Bank, East Asia had three-fourths of the Asian timber manufacturing capacity in 1966.^{3/} Malaysia, Indonesia, and the Philippines have made some progress in developing their own manufacturing industries, but the bulk of the manufacturing capacity is still in the countries which have to import logs. Japan satisfies more than half of its wood product needs from imports. Roughly 80 percent of the logs made into lumber and plywood in Korea and Taiwan is imported; Singapore and Hong Kong import 100 percent. FAO (Food and Agriculture Organization of the United Nations) statistics show that Japan, Korea, Taiwan, Singapore, and Hong Kong produced two-thirds of the lumber, veneer, and plywood manufactured in the Far East in 1970, but only 12 percent of the hardwood timber cut came from these countries. In 1972, these five countries apparently imported more than 30 million cubic meters of nonconiferous (hardwood) logs, primarily from Indonesia, Malaysia, and the Philippines (figure 2).

In 1960, Japan, Korea, Taiwan, and Singapore imported some 6 million cubic meters of hardwood logs. In the following 12 years there was a scramble for Southeast Asian timber as the imports to these four countries climbed to about 17 million cubic meters in

^{3/} J. Turbang and D. Von Hegel. Development of Forestry and Forest Industries in Asia. Asia Development Bank. January 1968.

FORESTRY SUBREGIONS OF ASIA, 1968



SOURCE: "DEVELOPMENT OF FORESTRY
AND FOREST INDUSTRIES IN
ASIA," ASIA DEVELOPMENT
BANK, 1968

PRINCIPAL FACTORS IN THE FAR EAST LOG TRAFFIC—1969

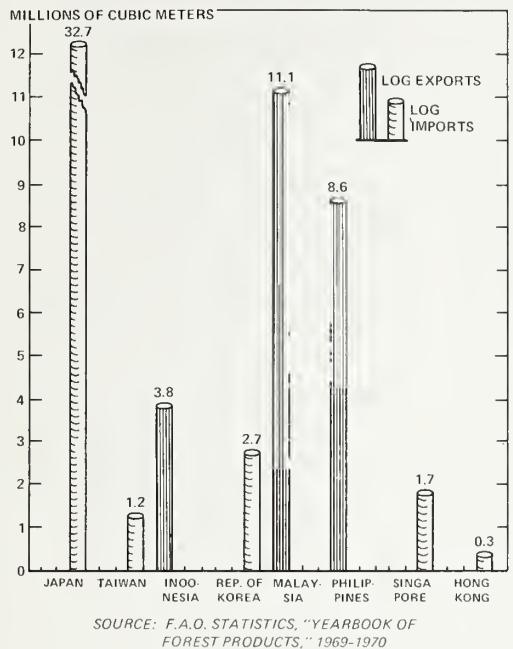


FIGURE 2

PAST AND PROJECTED IMPORTS OF SOUTHEAST ASIAN LOGS INTO JAPAN, KOREA, TAIWAN, AND SINGAPORE

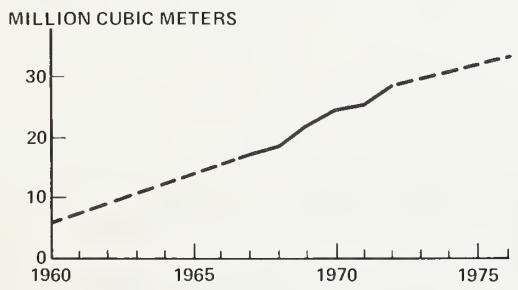


FIGURE 3

1967 and to 29 million cubic meters in 1972 (figure 3). The demand for this timber probably will rise and, if present trends continue, these four countries will seek to import at least 33 million cubic meters of logs in 1976.

The contention that demand for Southeast Asian logs will rise is best supported by the outlook in Japan, the principal consumer. In 1966, Japan imported 33 percent of the 77 million cubic meters of timber products it consumed (figure 4). Long-range plans prepared by the Government at that time indicated that, although Japan's need for timber would increase, the capacity of Japan's own forest to supply timber would increase more rapidly and that, by the year 2015, Japan would be 90 percent self sufficient insofar as timber is concerned. Subsequent developments have failed to support these predictions. Japan's demand for wood has risen more rapidly than anticipated; it was expected to reach 100 million cubic meters by 1975, but passed that figure in 1970. More importantly, the domestic production potential was probably overestimated. A domestic output of 132 million cubic meters was planned for the year 2015. According to one informed individual, though, it is more realistic to expect the sustainable annual cut to be no more than 100 million cubic meters if the environment is adequately protected. In any case, the ratio of imports to total consumption rose from 33 percent in 1966 to 55 percent in 1971 and 56 percent in 1972. The expected peak is 63 percent in 1981.

Ability to Meet Demand for Logs

An important issue here is whether Southeast Asia will be able to meet the increased demands for logs from these four countries on a

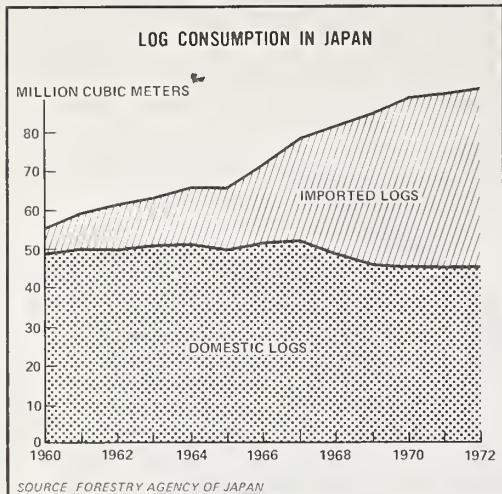


FIGURE 4

which purchase their supply on the serious depletion in the immediate future." "The uncommitted unexploited forest is unlikely to last beyond 1980 with a resultant gradual reduction in the total availability of high quality logs of the prime commercial species. This decline has already started and will reach

significant proportions over the next five years; it is probable that a relatively small flow of high quality logs will be maintained from the major long-term forest agreement areas (forest concessions) but this will be insignificant in terms of industrial demand."^{4/}

This ban may be temporary. In any case, it is evidence of an intention shared by most of the Southeast Asian timber countries.

The Philippines was for many years the principal source of logs in Southeast Asia. In 1967, that country supplied 50 percent of the logs imported by Japan, Korea, Taiwan, and Singapore. Log exports have since declined (figure 5). At the peak of logging activity, 12 million cubic meters of timber were cut annually. This has declined to about 9 million

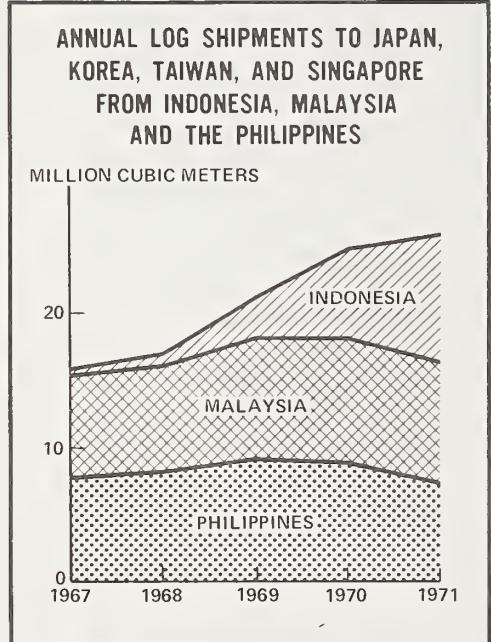


FIGURE 5

^{4/} Both quotations are from The Wood Based Industries of West Malaysia. FOD:SF/MAL/68 516 Technical report #4, United Nations Development Program, Food and Agriculture Organization of the United Nations. 1971.

cubic meters annually and may drop even lower. Several factors have contributed to this situation. The rate of cutting was too high, particularly considering the absence of proper forest management practices. The shifting "slash-burn" agriculture reportedly has destroyed an enormous volume of potentially usable timber. Severe floods in July and August 1972 aroused the public to the consequences of denudation, however, and led to a government ban on logging in central Luzon.

Log exports from the Philippines may be drastically curtailed by official action. There has been legislation on the books for several years to gradually restrict these exports, but the process was halted after the first 10 percent reduction. The Philippines Government recently announced that further restrictions will be made within the next 3 years.

Log exports from Malaysia have been fairly stable for several years. However, if the log export ban in West Malaysia is not rescinded, the volume of logs exported in 1973 will be significantly below previous years. Even if it is rescinded, log exports from all of Malaysia seem likely to decline in the years ahead.

In their search for logs, the industries of Japan, Korea, Taiwan, and Singapore have most recently turned to Indonesia and its vast hardwood forests. There has been a great rush by foreign investors to stake out claims in Indonesia. One analysis of the situation in 1972 projects an increase in timber cut from 10.5 million cubic meters in 1971 to 18 million in 1974.^{5/} This should offset some of the decline in output elsewhere in Southeast Asia. Even so, the prospect of shortage remains. There is a real possibility that the balance sheet will look like this in 1976:

	<u>Million cubic meters</u>
S.E. Asian Logs Required by Japan, Korea, Taiwan, and Singapore	33
Logs available for export:	
Philippines	5
Malaysia	7
Indonesia	13
Total	<u>25</u>

Even in the unlikely event of no decline in exports from the Philippines and Malaysia and no increase in local manufacturing in Indonesia, the full projected increase of Indonesian timber cut would barely meet the total projected demands of the four importing countries in 1976.

^{5/} Unpublished report obtained from the Japan External Trade Organization.

In considering Indonesia's forest, one should remember that not all of it should be used for continuing timber production. 6/

	<u>Million hectares</u>
Forested land to be reserved for watershed protection	48
Forested land suitable for conversion to agricultural production	18
Forest land currently deforested by shifting agriculture	10
Forested land suitable for permanent forest production	<u>24</u>
Total forest land area	100

An analysis of the Indonesian situation by Payne and Nordwall says, "...it is clear that there is the distinct risk that all the forest suitable for long-range forest management on a sustained production basis might easily be allocated before Indonesia has an inventory of the extent of its resource. This also points up the risk that Indonesia may not have the natural forest resources to support the current rate of allocation and still have the forest land producing at a sustained yield rate. Such a pessimistic outlook is further supported by the fall in volume that has occurred on each of the sample concessions." 7/

There is by no means agreement among those in the timber industry, but a number of individuals who seem to be looking farther ahead than most see supply problems in the future. Some mills that buy ramin logs (Gonystylus bancanus), an important light-colored species used for flooring, furniture, molding, and plywood, are already experiencing difficulty getting enough logs. Some timber industry people predict that this species will be in short supply in as few as 3 years. Other prime species, mainly lauans (also called merantis and Philippine mahoganies) can still be obtained without too much difficulty, although some say supply troubles will begin in about 10 years. One major plywood concern in Korea is diversifying into nonwood enterprises, partly in the expectation of log supply problems in the 1980's.

6/ Burnett H. Payne and David S. Nordwall. A Review of Certain Aspects of the Forestry Program and Organization in Indonesia. Field Report 10. Foreign Economic Development Service, U.S. Dept. of Agric. April 23, 1971.

7/ "Fall in volume" refers to the fact that these concessions have not contained as much timber as was anticipated.

Without reliable timber inventory data for much of Southeast Asia, it is unwise to be categoric about the supply outlook. Nevertheless, Vietnam can be optimistic about marketing its logs when it considers:

- The efforts of timber-rich countries to restrict log exports in the interest of doing more manufacturing themselves,
- The general absence of forest management in Southeast Asia,
- The historic pattern of overcutting in these countries,
- The limitations imposed by environmental considerations, and
- The prospect of rising demands for Southeast Asian wood.

Outlook for Log Prices

Log prices in Southeast Asia remained fairly stable from the middle 1960's through most of 1972 (table 3). 8/ West Malaysia banned exports of logs of major species in November 1972. This cut off Singapore's principal supply and Singapore timber concerns immediately moved into other markets. Some say this helped trigger the subsequent rise in prices. In any case, the Southeast Asian log market became a mass of confusion about December 1972 or January 1973. Prices climbed almost daily and, in many cases, firm contracts were broken by log suppliers to take advantage of higher prices. The following examples illustrate the rapid price changes that took place.

Korean plywood mill: During most of 1972 the price of lauan logs averaged between \$39 and \$40 per cubic meter, delivered. In January 1973 the price jumped to about \$50 and the contracts for February (before the currency revaluation) called for \$55 per cubic meter--a 39 percent increase from December 1972.

8/ The differences among countries do not mean there are significant differences in the prices paid for a given quality of log, in a particular market, at a specific time. Other factors are involved. Singapore, for example, was, until recently, receiving all of its logs from West Malaysia by truck at a relatively low transportation cost. The higher averages for Korea reflect longer transportation and the fact that log suppliers to that country are not paid when the logs are loaded on the ships but some period after the logs are delivered, which results in higher finance charges.

- Singapore sawmill: The f.o.b. price of ramin logs in Indonesia, per cubic meter, was:

August 1972	\$13.60
September 1972	18.40
November 1972	22.40
December 1972	32.00
February 1973	50.00 (a 56 percent increase over the December price)

- Singapore plywood mill: Log prices climbed 30 to 40 percent between December 1972 and February 1973.
- Taiwan plywood mill: Lauan log prices rose from \$32 per cubic meter in December 1972 (delivered) to \$72 in February 1973, prior to currency revaluation--a 125 percent increase.
- Tokyo newspaper: The price of lauan increased from \$33 per cubic meter in November 1972 to \$53 in January 1973--a rise of 60 percent.

Table 3.--Average prices of hardwood logs delivered to Japan, Korea, Taiwan, and Singapore

Year	: Japan-- lauans and apitongs	: Korea-- all hardwoods	: Taiwan-- all hardwoods	: Singapore-- all hardwoods except teak and ramin
	U.S. dollars per cubic meter (c.i.f.)			
1960	:		19.99	
1961	:		25.52	
1962	:		27.44	
1963	:		30.69	
1964	:		29.91	
1965	: 26.61	34.11	27.80	
1966	: 28.79	34.86	31.02	
1967	: 30.57	37.26	30.78	18.28
1968	: 30.07	36.73	30.88	20.47
1969	: 30.24	37.65	31.58	20.63
1970	: 31.82	41.97	32.31	21.36
1971	: 32.40	40.98	31.33	24.29
1972	: 30.95	37.94	32.14	
	:			
	:			

Source: Japan and Singapore--Federal import and export statistics; Taiwan--Joint Commission on Rural Reconstruction; Korea--Korea Plywood Industries Association.

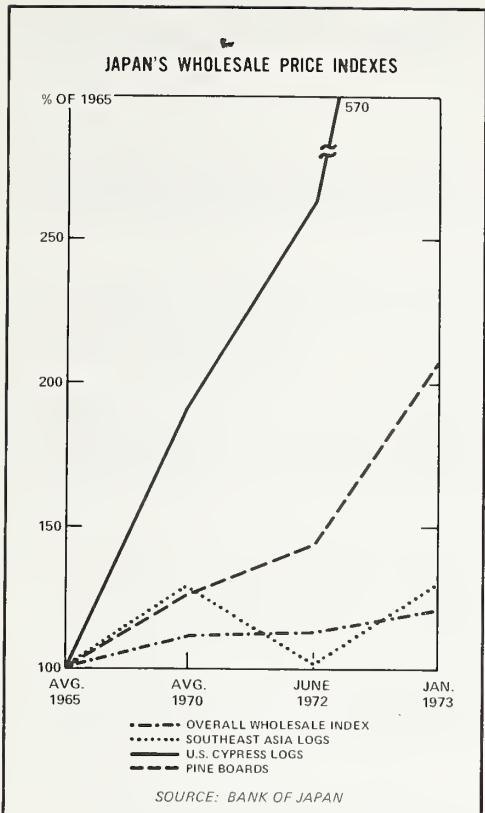


FIGURE 6

The overall picture is best presented in price index data from the Bank of Japan (figure 6 and table 4). Softwood log and lumber prices began to run away late in 1972. The price index for U.S. cypress logs (Port Orford Cedar) purchased in Japan soared to 570 in January 1973. Southeast Asia log prices began their sharp climb later and did not rise as high.

A number of factors played a part in the accelerated rise in log prices late in 1972 and early 1973. The most important factor seems to have been the mounting need for wood in Japan; between 1968 and 1972, total wood consumption rose more than 13 percent. Japan's housing boom was the principal reason for increased demand. There were 1.9 million housing starts in Japan during 1972. Traditionally, Japanese homes have been built of softwoods, of which there is now a critical domestic shortage. The principal outside source of high-quality softwood logs and lumber has been the United States and Canada. This accounts for the very rapid rise of log prices in the U.S. market. Unable to fill

its demand for softwoods, Japan began to substitute hardwoods for some purposes, starting a belated upward swing of hardwood prices.

Apparently very conscious of its precarious wood supply position, Japan increased its log stocks from a normal 2-month supply to a 3-month supply. The stockpiling further aggravated the log supply problem.

When West Malaysia banned exports of most species in November 1972, Singapore log buyers moved into Indonesia and East Malaysia. This undoubtedly helped shove log prices upward. European countries have had some difficulty maintaining hardwood imports from Africa and are importing more logs from the Far East than formerly, thus adding to the price pressure. Furthermore, resource depletion in the Philippines and West Malaysia is restricting the capacity and willingness of these countries to supply logs.

Since the log price hikes have been partly the result of overreaction by buyers and sellers, prices are expected to drop back

Table 4.—Wholesale price indexes in Japan
(1965 = 100)

Year	Overall whole- sale index	All wood products	Logs	Processed timber	Boards			Squares			Imported logs		
					Cedar	Pine	Cypress	Pine	Cypress	Pine	cypress	U.S.	S.E.
1960	97.9	79.3	76.7	83.2	79.7	84.4	77.5	74.0	82.0	74.9	94.7	91.5	91.5
1961	98.8	95.8	94.6	101.2	101.8	103.3	101.0	99.6	102.9	81.6	90.3	97.8	97.8
1962	97.3	96.5	94.5	101.6	96.8	96.1	98.1	98.9	101.9	92.4	100.0	100.8	100.8
1963	99.0	98.7	96.5	104.7	99.2	97.1	101.9	104.0	101.9	96.0	95.3	95.3	95.3
1964	99.2	99.9	97.7	102.7	103.7	99.5	97.7	102.7	101.6	100.0	100.0	100.0	100.0
1965	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1966	102.4	108.0	110.2	108.8	106.1	108.2	107.5	120.1	107.0	124.8	105.9	114.1	114.1
1967	104.3	120.7	129.3	109.1	117.9	123.0	126.6	156.2	126.2	181.9	116.7	116.7	116.7
1968	105.1	128.4	138.9	109.0	125.3	123.7	149.2	186.8	130.2	176.0	180.6	180.6	180.6
1969	107.4	132.7	141.2	109.8	127.4	120.5	153.9	209.8	133.1	180.6	120.2	120.2	120.2
1970	111.3	138.5	142.8	121.4	126.5	125.0	154.5	224.8	135.2	191.4	128.2	128.2	128.2
1971	110.5	132.6	134.3	108.7	119.5	122.3	144.0	200.6	132.6	200.9	124.5	124.5	124.5
1972	112.2	145.4	142.0	113.5	144.6	143.7	178.9	235.4	160.5	263.1	102.4	102.4	102.4
1973	Jan.	109.8	131.5	131.8	105.0	118.6	124.8	142.0	188.0	141.2	212.3	212.3	212.3
Feb.	110.0	131.2	129.6	105.9	119.2	124.8	142.5	190.0	140.8	141.5	212.6	212.6	212.6
March	110.3	130.4	128.0	106.1	119.0	124.0	141.6	190.0	140.0	141.5	212.7	212.7	212.7
April	110.6	130.8	128.7	105.9	119.7	124.4	142.5	189.1	141.9	141.9	213.6	213.6	213.6
May	110.6	130.8	128.4	105.2	119.7	125.9	144.6	189.1	141.9	141.9	213.6	213.6	213.6
June	110.7	131.7	129.0	105.8	120.7	125.9	145.8	189.8	142.4	142.4	213.6	213.6	213.6
July	110.9	133.9	131.4	107.5	125.3	126.3	150.9	195.6	146.0	146.0	213.9	213.9	213.9
Aug.	111.7	139.1	137.5	114.3	128.6	127.1	160.1	241.8	150.5	222.7	222.7	222.7	222.7
Sept.	112.7	142.2	141.1	117.1	132.0	130.3	167.1	245.4	153.8	248.2	248.2	248.2	248.2
Oct.	113.8	148.0	143.7	120.4	141.9	146.7	180.4	250.0	164.6	302.4	299.5	302.4	299.5
Nov.	116.4	184.7	173.3	126.3	217.7	213.8	298.7	361.3	218.3	399.4	100.7	100.7	100.7
Dec.	119.1	210.0	201.7	142.3	272.7	229.9	331.1	394.7	242.7	493.8	107.2	107.2	107.2

Classification deleted as of January 1973. Source: Bank of Japan.

from 1973 highs. However, log buyers who were questioned expect them to stay at least 20 to 30 percent above the 1972 level. Ven Ven logs (Anisoptera species) which could be profitably exported from Vietnam with earlier prices should be that much more profitable in the future.

MARKET OUTLOOK FOR PLYWOOD AND HARDWOOD LUMBER

The well-established lumber, veneer, and plywood industries of Japan, Korea, Taiwan, Hong Kong, and Singapore constitute a formidable competitive hurdle for developing countries such as Vietnam in their attempts to switch from log exports to manufactured exports. Each of the major wood importing countries to some degree has a growing economy, political stability, and a desirable financial environment. For example, the fact that a number of sawmills and plywood mills have chosen in the past several years to move into Singapore, which has no timber of its own, can be credited in part to its political stability and ethical financial environment.

In face of these handicaps, Vietnam's great hope for industrial development lies in the probability that world demands for tropical forest products will rise and that timber supplies elsewhere will shrink. Recent events indicate this is happening and that the timber industry of the Far East is entering a new era.

Plywood

One important trend has been the broadening of the market. Korea and Taiwan have been two of the world's major producers of hardwood plywood for export, and the United States has been the principal purchaser of that plywood. In 1971, 62 percent of Taiwan's exports and 94 percent of Korea's went to the United States. Although this has been a stable, dependable market, the heavy reliance on a single customer has been a disadvantage and both countries are attempting to broaden their outlets. Greater volumes of plywood are now being shipped to other parts of the world.

Japan's role in the world plywood market has been shifting. At one time it was a major exporter of hardwood plywood, manufactured from logs imported from Southeast Asia. More recently, Japan's own growing demands used most of its production, and exports dwindled. Another reason given for the decline in exports is increased competition from plywood plants in Taiwan and Korea, where labor is cheaper.

In very recent years Japan has become a net importer of plywood. However, it is still questionable whether this presages the opening up of the Japanese market to the plywood producers. Japan has achieved its industrial growth by rigidly adhering to a policy of importing raw materials and manufacturing for its own consumption and exports. This is particularly evident in the case of timber products. Plywood imports from Southeast Asia climbed from 6 million square meters in 1969 to 63 million in 1970. In 1971 imports fell to 14 million square meters,

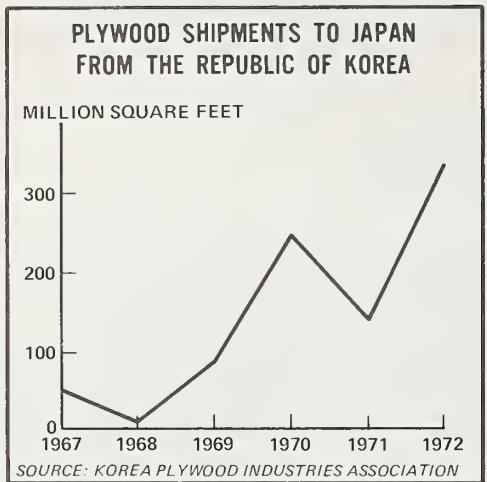


FIGURE 7

climbing back to 33 million in 1972. Some observers believe that the heavy purchases in 1970 and 1972 were temporary expedients to relieve domestic shortages and did not represent any basic change in national policy to open the door to more manufactured timber from neighboring nations.

Figure 7 shows the fluctuations in Korea's exports to Japan.

The surges of Japanese buying have stimulated plywood prices. Apparently Japan played a major role in driving plywood prices up in late 1972 and early 1973. Following is a 14-month trend in hardwood plywood prices in Taiwan that explains, in large part, the shift of the market toward Japan in that period. It also illustrates the competitive clout that Japan can wield.

Table 5.--Plywood f.o.b. prices in Taiwan

:	3/16 inch (4.76	:	2.7 millimeter
:	millimeters)	:	plywood
:	plywood to	:	to Japan
:	U.S. and Canada	:	
<u>U.S. \$ per thousand square feet</u>			
January 1972	\$41-42	\$27-28	
December 1972	42-44	44-46	
January 1973	50	51-52	
February 1973 <u>1/</u>	51	55	

1/ Prior to currency revaluation.

Lumber

In 1969, the latest year for which general statistics are available, Far Eastern countries exported 2.5 million cubic meters of lumber. Almost three quarters of these exports were from Malaysia

and Singapore. Following are the principal countries obtaining lumber from Singapore in 1971:

	<u>Thousand cubic meters</u>
Aden	32
Australia	25
Belgium, Luxembourg	5
France and Monaco	46
Iraq	8
Italy and San Marino	19
Japan	55
Netherlands	28
Reunion Island	15
Saudia Arabia	53
United Kingdom	33
U.S.A.	30
Mozambique	16
Trucial Oman	23
Other African Countries	104

Lumber prices early in 1973 followed log prices upward. In fact, to a large degree they have been pushed up by the rising prices of hardwood logs. The rise was so rapid that many lumber companies were making unprecedented requests for price renegotiations on orders that had already been accepted. For example, early in February 1973, one Taiwan concern requested its American buyer for a flat 55 percent increase over prices that had been negotiated earlier.

At what level lumber prices will stabilize is anybody's guess but it seems evident that, with increasing world demands and the re-evaluation of currencies, Vietnam will be breaking into the lumber export market at an opportune time.

Although Japan was the largest single importer of lumber from Singapore in 1971, hardwood lumber imports have been but a tiny part of the total Japanese lumber consumption. Imports of Southeast Asian hardwood lumber into Japan are only 1 or 2 percent of the volume of Southeast Asian logs imported into Japan to produce lumber. In the case of lumber, Japan has adhered strictly and effectively to the policy of importing only raw materials. A modification of that policy to permit the importation of Southeast Asian lumber in significant quantities would be a tremendous boon to Vietnam and the other Southeast Asian countries. In 1971 trade between Japan and the Republic of Vietnam included Vietnamese imports of \$150 million (U.S. dollar equivalents) and exports of \$4 million.

SINGAPORE'S TIMBER PRODUCT INDUSTRY

Singapore has a population of only 2 million, so it is not a large consumer of wood. It has no commercial forest land. Nevertheless, it is a significant force in the timber industry structure of the Far East and is particularly interesting from the standpoint of

the quality of the economic environment it has provided, the apparent vitality of its timber industry under recent adverse circumstances, and the quality of its timber marketing operation.

Singapore is the dynamic midget of the Far East. It has the fourth busiest seaport in the world. It is one of the world's hubs of international trade and, if things continue as they are, it will become more important as a trade center as time goes on. It has many international banks. Its economy is strong and growing. Between 1966 and 1971, the gross domestic expenditure almost doubled and other economic indicators show comparable gain (figure 8). Most important in the eyes of many businessmen who have moved into Singapore is the economic and political stability and high level of public ethics that characterize that city-state. A great effort has been made to create a business environment as clean as Singapore's spotless streets.

Timber processing has grown and changed drastically since World War II, from an essentially cottage-type business processing wood products mainly for local consumption to an industry dominated by modern plants.

Modernization of the timber products industry has been aided by the creation of three industrial parks and the allocation of space in these parks to sawmills and plywood mills. There were 110 sawmills, 8 plywood mills, and 1 veneer mill operating in 1972. Their principal emphasis is production for export. In 1971, the total value of wood product exports was about \$50 million--from a nation without a stick of timber of its own.

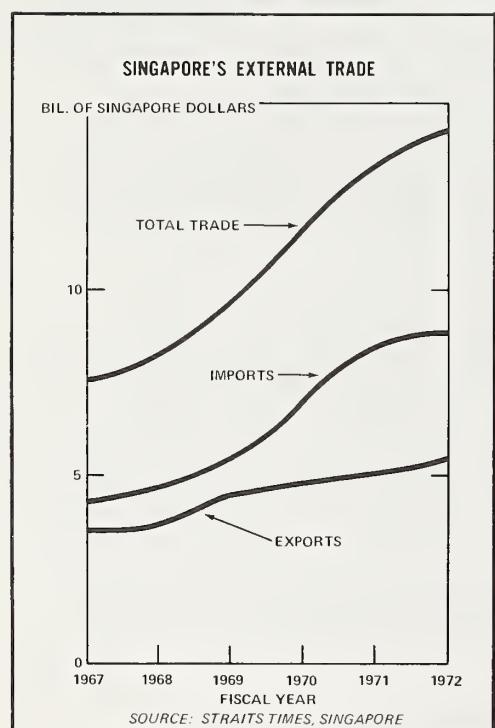


FIGURE 8

As in most of the East Asian timber nations, log consumption in Singapore has increased recently. In 1971, 1.4 million cubic meters of logs were imported--a 35 percent greater volume than in 1967:

Million cubic meters
of log imports

1967	1.0
1968	1.2
1969	1.3
1970	1.5
1971	1.4

Data are not available for 1972, but log imports were apparently up again.

Further expansions are planned for the next few years. The Singapore Government has guided the growth away from sawmilling; the principal emphasis today is toward more capital-intensive plywood plants.

Timber industry development has not been hindered by export or import duties because there are none. There is, however, a 29 cent charge per hoppus ton on lumber exports. This is used to finance the Timber Export Industry Board.

Apparently, about 27 percent of the logs imported into Singapore in 1970 went into the manufacture of plywood and veneer. Since then there has been a great change. In August 1972, eight plywood plants and one veneer mill were in operation. Two more plywood mills were being constructed and another had been authorized (i.e., assigned space in one of the industrial parks). These factories are listed below with their estimated annual log requirements when they all are in full-scale operation (1975 or sooner).

	<u>Thousand cubic meters</u>
Singapore Eidai Corporation Ltd.	245
International Wood Products Ltd.	171
Pan Malaysia Industries Ltd.	121
Singapore Plywood Ltd.	50
Starlight Timber Products Co. Ltd.	208
Veneer Products Ltd.	171
Jurong Plywood Co. Ltd.	182
Southern Wood Products Ltd.	268
Bork Singapore Ltd. (Veneer)	23
Kranji Plywood Industrial Co. Ltd. (Under construction)	361
Sunlight Timber Products Co. Ltd. (Under construction)	97
Golden Star (In planning)	---
Total	1,897

These capacities were estimated by the companies and then, in several cases, cut back to what seems to be more realistic expectations. Even so, the log consumption by the plywood mills will probably be four or five times greater when all these companies are in full operation than it was in 1970.

Lumber exports from Singapore were 24 percent higher in 1972 than in 1971. Even if lumber production were to decline in the next few years, the planned expansion of the plywood industry would greatly increase log requirements. Figure 9 suggests that the total log consumption in Singapore may almost double to 2.7 million cubic meters in 1975. This assumes that lumber output will decline as some of the smaller, older sawmills cease production. This may prove to be a faulty assumption.

**THE CHANGING CHARACTER
OF SINGAPORE'S TIMBER
INDUSTRY AS EXPRESSED
BY LOG CONSUMPTION
(million cubic meters)**

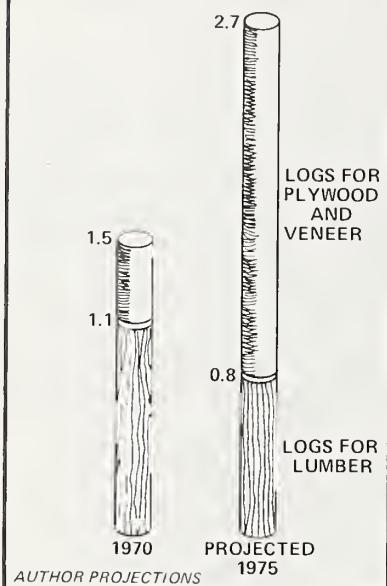


FIGURE 9

and the greater availability of ships there than at other ports in the region.

Singapore has attained a relatively high quality business atmosphere in its timber trade largely because of a Timber Export Industry Board established in 1968. This board is a quasi-official agency created by legislative action. Its purpose is both to promote lumber sales and to maintain the highest possible standards in the lumber export business.

The Board is composed of:^{10/}

- A chairman appointed jointly by the Minister of Commerce and Industry of Malaysia and the Minister of Finance of Singapore;
- Two members representing the Government of Malaysia;

^{9/} 1969 data used for Taiwan.

^{10/} Taken from a brochure by the Timber Export Industry Board of Malaysia and Singapore. In 1973 the cooperation between the Malaysian and Singapore governments was dissolved. The Singapore Board continues to function separately and plans are to issue a new legislative charter that might also include veneer and plywood plants.

THE LUMBER INDUSTRY

Singapore is second only to Malaysia in the Far East as a lumber exporter. Lumber exports were valued at \$37 million in 1970 and \$31 million in 1971. Both figures were considerably exceeded in 1972. The following tabulation shows how Singapore's lumber exports in 1970 compared with other Far East countries:

Thousands cubic meters

Malaysia	1,415
Singapore	764
Japan	159
Philippines	140
Burma	116
Taiwan	52 9/

One fourth or more of the lumber exported from Singapore is actually manufactured in West Malaysia. This is because of Singapore's excellent port facilities

and the greater availability of ships there than at other ports in the region.

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- One member representing the Government of Singapore;
- Five persons representing the timber industry of Malaysia nominated by trade bodies; and
- Two persons representing the timber industry of Singapore nominated by trade bodies.

The Board:

- Exercises control over the industry of the two countries to maintain high standards of conduct in carrying out timber exports.
- Monitors the quality of the timber for export and the due performance of contractual obligations.
- Serves the interests of both exporters and importers of Malaysian timber.
- Maintains a marketing service to promote Malaysian timber exports and to search for new markets.
- Provides a research service to gather information on the needs of various markets and assists the export industry in meeting such requirements.
- Activates promotional projects in the world markets to publicize and popularize the uses of Malaysian timber.
- Provides a liaison service to cooperate with trade bodies of importing countries.
- Serves as the central and unified organization to represent the timber export industry of the two countries in the international sphere.
- Publishes monthly statistical reports on timber exports; these are available at printing cost by subscription.
- Receives trade inquiries and redirects them to the exporters to establish trade connections.
- Prepares trade papers on timber utilization for distribution to importers on application.

In Singapore the Export Industry Board publishes a number of directories. In addition, it has broad regulatory authority with the power of enforcement. Its regulations may--

- (a) Prescribe the form of export registration certificates to be issued under the enabling act, and the conditions to be attached to such certificates;

- (b) Prescribe the information to be supplied by a person applying for an export registration certificate;
- (c) Prescribe the contracts to be adopted by persons exporting timber, including the terms and conditions incorporated into such contracts;
- (d) Prescribe the standards and methods of timber grading;
- (e) Regulate timber pricing;
- (f) Prescribe the fees to be charged for issuing an export registration certificate;
- (g) Regulate, control, and protect all stages of export production--from the felling of trees to the shipment of the exported product from any port; and
- (h) Establish procedures for maintaining proper standards of conduct in the timber trade including methods for dealing with infringements.

All timber exporters and all suppliers of timber for export are required by law to register with the Board and are subject to its control. This assures an orderly market for importers of timber from these regions. All these activities are toward the ultimate aim of promoting timber exports to the international markets.

The interest of the Timber Industry Board in maintaining a high level of business conduct was demonstrated early in 1973 when many suppliers of logs, lumber, and plywood in the Far East were defaulting on established contracts because of skyrocketing costs and prices. Following in part is a circular issued by the Timber Export Industry Board:

"To All Registered Exporters and Suppliers in Singapore.

REGISTRATION AND BUSINESS CONDUCT

I draw your attention to Section 3 of Timber Export Registration Certificate (Conditions & Fees) Regulations, 1968 governing the conditions of registration of Timber exporters and Section 5 (4) of Registration of Timber (Export) Suppliers Regulations, 1968 governing the powers of the Board to impose restrictions and conditions on Timber Suppliers Registration Certificates. Fundamental in the registration of timber exporters and suppliers is the duty of the registrant to carry on business of exporting or supplying timber for export, whichever the case may be, in accordance with a proper business conduct and in good faith. The continuance of the registration of a timber exporter or timber supplier will depend on whether the registrant can conduct his business in a responsible manner.

The manner in which some exporters and suppliers carry on business of late, with particular reference to performance of contracts, has caused a lot of difficulties for overseas consumers. I view this matter with grave concern. I have reasons to believe that the root of the problem stems from the constant failure by many timber suppliers to deliver contracts within the delivery dates stipulated.

It is evident that under conditions of rising prices as prevailing today, it has become a widespread practice among timber suppliers to deliver only contracts closed at higher prices whilst disregarding completely those entered into at earlier dates at prices which because of subsequent price increase have become relatively less favorable. Many suppliers are taking advantage of the current situation by producing timber to supply against contracts which offer the highest price although they have prior to that accepted orders from various other exporters for similar specifications at prices which have become somewhat less attractive. It is also reported that some suppliers deliberately withhold the signing of contracts sent to them by the exporters after having agreed to accept the orders when those contracts were negotiated in anticipation of further price increase in which event, they would reject the earlier contracts in preference to new contracts from other exporters who may offer better prices. Timber suppliers whose basic motive is quick gain are doing a grave harm to the long-term interest of the timber industry as a whole. I would stress that the irresponsible manner in which some timber suppliers conduct business will not be tolerated and, therefore, should stop.

The Board, therefore, proposes to review the registration of all timber suppliers presently holding Timber Suppliers Registration Certificates and take appropriate steps against those who have failed to honor their obligations. I, therefore, request all exporters to bring to the attention of the Board the names of timber suppliers who have failed to fulfill their contracts in accordance with the format as per Appendix A....."

This is but one facet of the Board's efforts to maintain the excellent trade posture that Singapore has assumed. This trade posture is one of Singapore's more important marketing strengths.

Singapore's lumber industry is especially significant because, in contrast with the log imports into Japan, Korea, and Taiwan, which apparently are at least 90 percent lauan species, Singapore uses a number of different kinds of trees (table 6). In 1972, the Singapore lumber exports were only about 50 percent lauan. Similar figures are not available for plywood plants, but their price lists indicate an interest in a number of non-lauan species.

Table 6.--Hardwood lumber exported from Singapore, by species and uses, 1972

Scientific name	Malaysian name	Vietnamese name	Percent of lumber exports	Typical uses
Heavy Hardwoods				
<i>Shorea</i> species		bo bo, ca chak, chai, sen mu	3.0	Flooring, construction, sleepers, truck bodies
<i>Intsia palembanica</i>	merbau	gu nuoc	0.2	Flooring, furniture, joinery, construction, plywood, door and window frames
<i>Balanocarpus heimii</i>	chengal		0.1	Heavy construction, boats, flooring, truck bodies
Total			3.3	
Medium Hardwoods				
<i>Dipterocarpus</i> species	keruing	dau, cho-nau	24.1	Construction, sleepers, truck bodies, plywood, boats
<i>Kompassia malaccensis</i>	kempas		5.7	Furniture, construction, sleepers, flooring
<i>Dryobalanops aromatica</i>	kapur		2.4	Flooring, construction, truck bodies, door and window frames
Mixed medium hardwoods			0.1	
Total			32.3	
Light Hardwoods				
<i>Shorea</i> species	dark red meranti		28.5	Flooring, furniture, joinery, plywood, paneling door and window frames
<i>Gonystylus bancanus</i>	ramin		11.3	Furniture, joinery, flooring, ceilings, paneling door and window frames, plywood, small wooden articles
<i>Shorea</i> species	red meranti		11.0	Flooring, furniture, joinery, plywood paneling door and window frames
<i>Shorea</i> species	light red meranti		7.2	Flooring, furniture, joinery, plywood, paneling door and window frames
<i>Dyera costulata</i>	jelutong		3.3	Joinery, pattern making, battery separators
<i>Sapotaceae</i> species	nyatoh	may-lai, viet	0.6	Flooring, furniture, joinery, construction, plywood, door and window frames
<i>Shorea</i> species	yellow meranti	gu, go-mat	0.6	Furniture, joinery, plywood
<i>Sindora</i> species	sepiter	geronggang	0.6	Furniture, joinery, plywood, paneling
<i>Crateoxyylon arborescens</i>		mersawa	0.2	Furniture, joinery, construction, paneling
<i>Anisoptera</i> species	ven-ven		0.1	Flooring, furniture, joinery, construction, plywood, door and window frames
Mixed light hardwoods			0.3	
<i>Agathis</i> species	damar minyak		0.1	Joinery, paneling
<i>Shorea</i> species	seraya		0.6	Furniture, joinery, plywood, paneling
Total			64.4	
Grand total			100.0	

Vietnam's timber species do not match Singapore's lumber production needs very well. Inventories indicate that only one-third of the timber species and species groups sawed into lumber in Singapore are found in Vietnam. These are species that accounted for about 29 percent of the Singapore lumber exports in 1972.

Even more significant is that lauan (Philippine mahogany, meranti), which brought Southeast Asia's forest into the limelight in the first place, is in short supply in Vietnam. There are several Shorea species in Vietnam, but these are all heavy woods like West Malaysia's balau and are not comparable to the lauans being cut elsewhere.

None of this indicates, of course, that Vietnam's woods cannot be used. It does indicate that they are different and, to a considerable degree, unknown. Some may not be as good as species currently being used. Others may be better. Many are probably comparable in characteristics with species now being marketed. These properties need to be determined and catalogued before the opportunities can be completely appraised.

THE VENEER AND PLYWOOD INDUSTRY

As pointed out earlier, the Singapore veneer and plywood industry is going through a period of expansion. Production figures are not available, but the output probably increased fivefold between 1967 and 1971. Net exports of plain and veneered plywood--that is, the excess of exports over imports--rose from 36 million square feet per year to 248 million during that period (table 7).

FAO statistics rank Singapore far behind Korea, Taiwan, and the Philippines in plywood exports. However, Singapore's plywood industry is undergoing a period of vigorous growth and is in an advantageous position in its proximity to the Indonesian and Malaysian timber resources. The fact that several of the newer plywood mills in Singapore are of Taiwanese ownership is evidence of that advantage.

Plywood and veneer exports, 1970

Thousand cubic meters

Korea	822
Philippines	370
Japan	327
Taiwan	708 est.
Indonesia	---
Malaysia	165
Singapore	163
Hong Kong	0.5

Table 7.--Plywood and veneer exports from Singapore

Year	Quantity			Value			Total plywood and veneer
	Veneer	Plywood with veneer	Plywood faced with plastic	Total plywood	Veneer	Plain plywood	
	Million square feet			Thousand U.S. dollars			
1967	163.2	77.2	9.0	0.2	86.4	2,905	4,410
1968	253.3	120.8	28.0	0.1	148.9	4,128	6,912
1969	191.1	191.4	44.7	0.6	236.7	3,327	10,731
1970	132.9	257.2	25.2	1.1	283.5	2,726	14,663
1971	309.6	358.4	25.3	0.9	384.6	5,294	19,186

More than a dozen species and species groups of timber are used for plywood in Singapore:

<u>Scientific Name</u>	<u>Malaysian</u>	<u>Vietnamese</u>
Tarrietia cochinchinensis	mengkulang	huynh
Anisoptera species	mersawa	ven-ven
Gonystylus bancanus	ramin	
Shorea species	meranti	
Dryobalanops species	kapur	
Dipterocarpus species	keruing	dau
Bombacaceae species		
Hopea species	merawan	sao
Alstonia scholaris	pulai	mop
Cratoxylon arborescens	geronggang	
Burseraceae species	kedongdong	
Dyera costulata	jelutong	
Parashorea species	gerutu gerutu	cho-chi

STRENGTH OF THE TIMBER INDUSTRY DEVELOPMENT IN SINGAPORE

On November 15, 1972, West Malaysia placed a ban on the export of 10 species and species groups of logs which probably accounted for 90 percent of the log exports from West Malaysia. This was a setback to Singapore, which had been getting practically all of its logs from there. Aware of the danger inherent in such complete dependence on a single log source, Singapore timber plants began to look elsewhere for logs early in 1972, but the log export ban caught these plants still heavily dependent on West Malaysia. Remarkably quickly, Singapore was able to recover from its setback and establish other sources of supply. Because of nearness to log supplies in East Malaysia and Indonesia and a strong marketing operation, the timber industry of Singapore should continue to be very competitive.

PRICES

In view of the runaway markets in late 1972 and early 1973, past price data have limited meaning. One thing they do indicate, though, is that the lighter-weight woods have, on the average, been more valuable than the heavier species. Table 8 shows, for example, that during the first quarter of 1972, the price of "light hardwood" lumber was almost twice as high as the price of "heavy hardwoods." Since Vietnam's forests apparently contain many heavy hardwoods, this is significant. However, changes occurring in the Japanese market may provide a bigger outlet and higher prices for the medium and heavy hardwoods. This will be discussed later.

Table 8.--Average export prices for lumber produced in Singapore, first quarter, 1972 ^{1/}

Species group	U.S. dollars per cubic meter, f.o.b.		
	Graded	Ungraded	All lumber
	:	:	:
Heavy hardwoods	61	25	30
Medium hardwoods	40	32	35
Light hardwoods	56	31	56
All species	54	31	49
:			

1/ Based on the rate of 2.8 Singapore dollars to 1 U.S. dollar.

Hardwood lumber prices have been climbing since 1967. They dropped back in 1971, but rose again in 1972 and reached new highs early in 1973 (figure 10 and table 9).

Table 9.--Hardwood lumber price changes reported by one Singapore exporter

	U.S. dollars per cubic meter		
	Dark Red	Meranti	Ramin
	:	:	:
April 1972	65		71
November 1972	114		78
February 1973	114		106
:			

The plywood market has not been as favorable (figure 10). Plywood prices followed lumber prices downward in 1971, but the drop was not quite as great as in the case of lumber. Nevertheless, the 1971 prices were the lowest in the 5-year period. Plain and veneered plywood export prices (f.o.b.) were:

	<u>U.S. \$ per</u>
	<u>square foot</u>
1967	.0582
1968	.0575
1969	.0559
1970	.0574
1971	.0541

More recent data on Singapore plywood prices are not available. However, the plants here undoubtedly shared in the early 1973 price gain forced by rising log prices and further stimulated by heavy

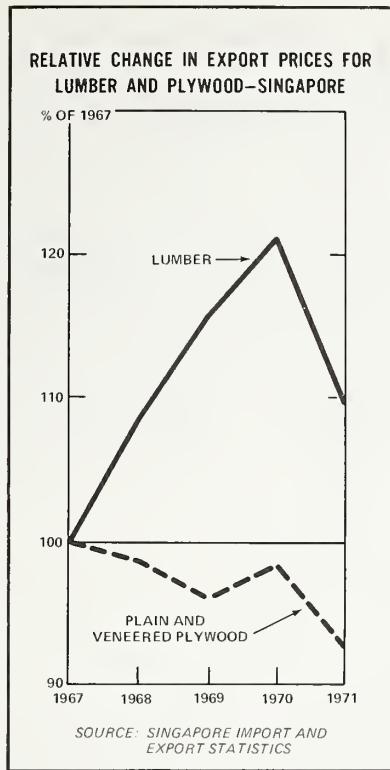


FIGURE 10

Japanese buying. Such fragmentary information as is available indicates that the rise in plywood prices has not been as great as lumber price increases. The rather unusual situation in Singapore during the first part of 1973 was that sawmills were paying more for logs than were plywood mills.

Following is the trend in delivered log prices into Singapore (sawlogs and plywood logs combined) from 1967 through 1971:

U.S. Dollars per cubic meter

1967	\$18.25
1968	20.42
1969	20.66
1970	21.47
1971	24.85

Average log prices during January 1973 were somewhere between \$35 and \$40 per cubic meter.

REPUBLIC OF KOREA'S TIMBER PRODUCT INDUSTRY

Between 1960 and 1971 the gross national product of the Republic of Korea increased more than 12 times--from 247 billion won to 3,086 billion won. A primary factor in these gains was the drive to industrialize and develop exports for foreign exchange. One of the big success stories in that effort has been the tremendous growth of the plywood industry established primarily for overseas trade. Plywood exports climbed from zero in 1958 to \$176 million in 1972. Korea today is the number one nation in hardwood plywood exports. It has 11 plywood companies producing for export plus 40 or so smaller ones producing for local consumption.¹¹

In 1964, plywood was first among the Republic of Korea's exports. It continues to be important, but some of its sheen has worn off. The high cost of logs used to manufacture the plywood reduces the net gain in foreign exchange. Every plywood log is imported from the Philippines, Malaysia, or Indonesia. Secondly, plywood production has not been as profitable as might have been expected. Nine-tenths of Korea's exported plywood has been shipped to the United States, mainly through a handful of big importers. Wholesale prices of hardwood plywood in the United States were fairly constant during the 1960's, and declined in relation

¹¹/ The Korean plywood industry is ably described in a report by the U.S. Agency for International Development, Survey of the Korean Hardwood Plywood Industry and International Plywood Markets--1972.

to the costs of other building materials. This situation has been attributed to both an over-production of hardwood plywood and to the strong hold of a few American companies over the Korean industry. Whatever the reason, the prices for hardwood plywood were, until the beginning of 1973, very stable, but not high enough to produce profits comparable with other industries.^{12/}

The Korean plywood industry is likely to have growing difficulty satisfying its log needs in the years ahead. Korea has 6.6 million hectares of forest land, but this land has been badly abused and is far from being highly productive. In 1970, 82 percent of the wood used by industry was imported, including all of the logs for plywood:

Thousand cubic meters ^{13/}

Total demand	4,656
Domestic logs	845
Imported logs and wood products	3,811
Used for plywood	2,236
Used for other purposes	1,575

Between 1965 and 1972, log imports shot up from about a half million cubic meters to 2.8 million (figure 11). Projections by Korea's Office of Forestry anticipate a much smaller 19 percent additional increase by 1976. While it may not be difficult to achieve that goal, it will be hard to maintain it.



FIGURE 11

Korean plywood plants are handicapped by being farther away from the Southeast Asian log supply than Taiwan and Singapore. This handicap has not prevented rapid production expansion in the past, but it may cause difficulty in the future. Moreover, Korean plants suffer from a shortage of funds for log procurement and the cost of financing is said to be high.

Japan is, of course, no closer to the principal sources of logs, but

12/ See footnote on page 27.

13/ *Forestry in Korea*. Office of Forestry, Republic of Korea. 1971.

its financial strength and competitive clout are much greater than Korea's. Korea's disadvantages are offset somewhat by the lower freight costs on plywood shipped to the United States. Rates from Japan to the United States have been 14 to 34 percent higher than rates from Korea. Rates from Taiwan have been up to 40 percent higher than Korea's and from the Philippines up to 74 percent higher. Korea's edge comes from the fact that the export plywood industry is concentrated near three ports, permitting fast, easy loading and large loads. 14/

Table 10 shows the sources of Korea's log imports since 1965. In that period, imports from the Philippines dropped from 45 percent of Korea's consumption to 13 percent and log imports from Indonesia increased from zero to 47 percent. Lauan species account for 95 percent of the logs imported. The rest have been mainly Apitong.

Table 10.--Log imports by the Republic of Korea, 1965-72

Year	Source			Total
	Philippines	Malaysia	Indonesia	
	:	:	:	
Thousand cubic meters				
1965	161	350	---	511
1966	277	430	---	707
1967	418	574	---	992
1968	375	879	5	1,259
1969	907	1,048	50	2,005
1970	844	1,056	210	2,110
1971	811	1,156	735	2,702
1972	376	1,126	1,314	2,816
:				

Source: Korea Plywood Industries Association.

Average log prices rose about 20 percent from 1965 to 1971 and fell back in 1972 (table 11). Some of the log price variations are due to shipping costs. According to a plywood company official, the delivered cost of logs rose from \$38.86 per cubic meter c.i.f. in December 1972 to \$50 in January 1973. February 1973 contracts called for \$55 before the currency revaluation. He expected the price would drop some after that, but not much. In U.S. dollars it may not decline at all.

14/ See footnote 11, page 27.

Table 11.--Unit prices of logs imported by the Republic of Korea

Year	Source				Total
	Philippines	Malaysia	Indonesia	:	
	:	:	:	:	
U.S. dollars per cubic meter, c.i.f.					
1965	34.35	34.00	---		34.11
1966	33.92	35.47	---		34.86
1967	35.06	38.87	---		37.26
1968	34.72	35.56	42.20		36.73
1969	35.54	39.49	37.50		37.65
1970	37.86	45.47	40.81		41.97
1971	40.07	42.47	39.65		40.98
1972	36.82	37.02	39.02		37.94
Dec. 1972	35.72	38.50	39.71		38.86
:					

Source: Korea Plywood Industries Association.

TAIWAN'S TIMBER PRODUCT INDUSTRY

Like Korea, the Republic of China (Taiwan) has relied heavily on timber product industries in building up national income, foreign exchange, and employment. The wood industries played a substantial part in lifting Taiwan's gross national product from \$1.6 billion in 1960 to \$7.2 billion in 1972. Like Korea, also, much of the timber industries' growth has been based on Southeast Asian timber.

One important difference is that, although plywood has been the mainstay of the wood-based industrial development in Taiwan, there has been a substantial lumber export also. Following are the export values in 1970:

	<u>Million U.S. \$</u>
Plywood	77.9
Lumber	22.2
Pulp and Paper	9.9
Logs	6.5
Furniture	3.0
	<u>119.5</u>

The volume of plywood exported from Taiwan in 1970 was about 36 times greater than the exports in 1960. The value of these exports was about 30 times greater than in 1960, indicating that the price per unit of plywood didn't change much in that period (figure 12). As a matter of fact, average unit prices for plywood during 1962 were higher than during any year through 1970. This, added to the evidence in Korea and Singapore, underscores the lack of buoyancy of the hard-wood plywood prices throughout the period of rapid production capacity expansion.

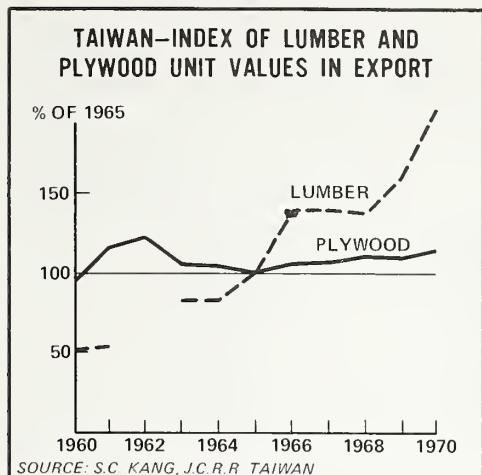


FIGURE 12

The first sustained surge of plywood prices began at the end of 1972. In mid-February 1973, the price of 3/16-inch hardwood plywood purchased by the United States was almost 25 percent higher than in January 1972. The price of 2.7 millimeter plywood purchased by Japan almost doubled in the same period.

The lumber situation has been quite different. Although lumber exports increased sixfold from 1960 to 1970, the total value of these exports went 23 times higher in that period. Credit for this largely goes to native species, particularly Taiwan cypress, which is very much desired in Japan and brings extremely

high prices. Nevertheless, the Singapore data suggest the lumber prices for Southeast Asian lumber, in general, have been steadily rising in recent years. As in the case of plywood, the price increases were very rapid early in 1973. In mid-February 1973, prices were being quoted for hardwood lumber from Taiwan that were 55 percent higher than a month or so before.

Taiwan's timber industry expansion, as in the rest of the Far East, has been largely fueled by logs from Southeast Asia. Plywood mills have been particularly dependent on wood from the Philippines, Malaysia, and Indonesia, and more than 90 percent of their raw material has been lauan logs. The following tabulation shows the approximate overall situation in 1972:

	<u>Million cubic meters</u>
Output of domestic logs	1.2
Imported logs (Southeast Asia)	2.8
Apparent total log consumption	<u>4.0</u>
Wood products consumed in Taiwan	1.7
Logs and wood products exported	2.3

In effect, log imports are sustaining all of Taiwan's manufactured wood exports and supplying some domestic needs besides.

Log imports into Taiwan climbed steadily from 168 thousand cubic meters in 1960 to 2.8 million cubic meters in 1972 (figure 13).

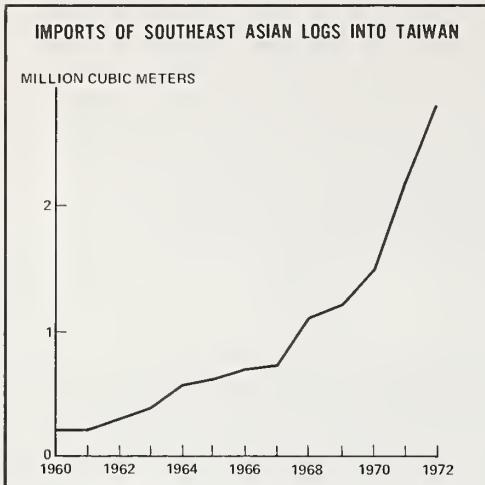


FIGURE 13

From 1967 through 1972, the average delivered value of Southeast Asian logs in Taiwan was remarkably consistent:

U.S. \$ per cubic meter

1966	31.02
1967	30.25
1968	31.01
1969	31.58
1970	31.92
1971	31.21
1972	32.14

However, the price of lauan logs in February 1973 (before the currency revaluation) appears to have been at least 50 percent above the 1972 average. An official of one company reported a quotation of \$72 per cubic meter.

The Philippines has consistently been the principal source of Taiwan's lauan logs, with Malaysia ranking next (table 12). However, imports from Indonesia have risen rapidly since 1969, and that country should soon become Taiwan's principal source of Southeast Asian logs. Log shipments from both the Philippines and Malaysia are expected to decline.

Table 12.--Imports of Southeast Asian logs into Taiwan

Source	Year				
	1967	1968	1969	1970	1971
	:	:	:	:	:
Philippines	415.6	683.9	562.3	596.6	893.7
Malaysia	303.2	159.1	309.2	552.2	576.6
Indonesia	1.4	39.6	139.1	305.8	615.9
Others	7.0	207.5	172.4	34.7	129.1
Total	727.2	1,090.1	1,183.0	1,489.3	2,215.3

During February 1973 the principal concern of public and industry officials seemed to be runaway log costs and the squeeze between these costs and product prices. At the same time, though, a few were raising questions about the long-run log supply outlook. How many

years will it be before it will be difficult, if not impossible, to fully satisfy Taiwan industries' appetite for Southeast Asian logs? Prompted by this concern and an interest in the Southeast Asian developing countries, the Forestry Division of Taiwan's Joint Commission on Rural Reconstruction has proposed a package development program that could be applied to Vietnam. This would involve assistance in:

1. Developing a timber industry to supply logs for export and, presumably, also constructing manufacturing facilities in the timber country.
2. Planning and aiding in the establishment of a forestry program that would assure sustained production of timber products instead of liquidation of the resource.
3. Assistance in finding markets for secondary species not now in demand. This would involve testing lesser-known species to determine their physical characteristics, properties, and suitabilities. It would also involve finding uses for secondary species of logs in Taiwan. One Taiwan industrialist with plywood, lumber, particleboard, hardboard, and laminating plants has said he could use virtually any species Vietnam can produce.

The Taiwan Ministry of Economic Affairs has endorsed the broad principle of assistance that the Forestry Division has outlined.

International cooperation of this sort is full of pitfalls. It is easier to be successful in exporting logs than in the other aspects. For this reason, the success of such a venture would depend largely on the quality of leadership provided by the Vietnamese Government. In accepting any proposal of aid and cooperation from Taiwan, it would be desirable to have both governments involved in the planning and the Taiwan Government directly responsible for fulfillment of any agreement.

At present each Taiwan company imports its own logs and has its own desires as to species. If broader use of species is to be achieved, a system will be needed where the logs are imported by trading companies and then distributed among manufacturers in accordance with their needs. Japan has such a system now.

If Taiwan were to enter an agreement with Vietnam to operate a concession, it would expect to import a reasonable proportion of the log output. Some equitable split of the logs would have to be arranged which could be related to the amount of forestry help provided. The prices of the logs exported would have to take this into account also.

Other complications would have to be overcome but, nonetheless, this type of joint venture offers a way for a much more desirable development of concessions than is likely to be achieved otherwise.

More than most nations, Japan lives with the constant threat of raw materials shortages--a threat that it has kept at bay with constant hustling. The amount of hustling required may be judged from the fact that, in 1969, Japan imported 98 percent of its iron ore, 76 percent of its coking coal, 74 percent of its copper concentrates, 55 percent of its wood, practically all of its crude oil, and all of its bauxite. Japan has created the most efficient raw materials procurement operation the world has ever seen, literally covering all corners of the earth in the process. However, it seems safe to say that the organizations and individuals engaged in this effort will be sorely tested as they strive to satisfy Japan's mounting appetite for almost everything. Vulnerable now in respect to raw materials, Japan is going to become more vulnerable in the years ahead, whether it continues to grow as planned or not.

The Economic Research Council of Japan has projected a gross national product increase from \$205 billion in 1970 to \$1,704 billion in 1985. Even with a sizable substitution of other materials for wood, Japan will need timber in increasing amounts to support such growth. In 1965 timber consumption was 70 million cubic meters. Japan consumed 101 million cubic meters of timber products in 1971, including a fairly small volume that was exported. Current forecasts indicate that, by 1991, demands will rise to over 147 million cubic meters (table 13).

Table 13.--Timber demands in Japan, 1971 and projections to 2021

Year	Total demand	Supplied by domestic production	Supplied by imports	Percentage of exports to total
	<u>Million cubic meters, roundwood</u>			
1971	101.4	46.0	55.4	55
1981	134.8	49.7	85.1	63
1991	147.3	58.7	88.6	60
2021	152.9	94.3	58.6	38

Source: Basic Plan Relating to Forest Resources and Long-Term Forecasts Relating to the Demand for and the Supply of Important Forest Products.
Japan Cabinet decision of February 16, 1973. Unofficial translation.

In 1971, 46 million cubic meters of timber were cut in Japan; this met less than half of the country's requirements (figure 14). The 1971 cut was lower than cuts in the late 1960's, and government officials estimate that only a small increase will be possible by 1981. Even in the 1980's, the timber cut will rise much slower than the anticipated demands. Their calculations show that, even in the year 2021, when Japan's forests are expected to reach full productivity, the

imported wood required to run the economy will be somewhat greater than in 1971.

SOURCE OF JAPAN'S LUMBER AND PLYWOOD 1971

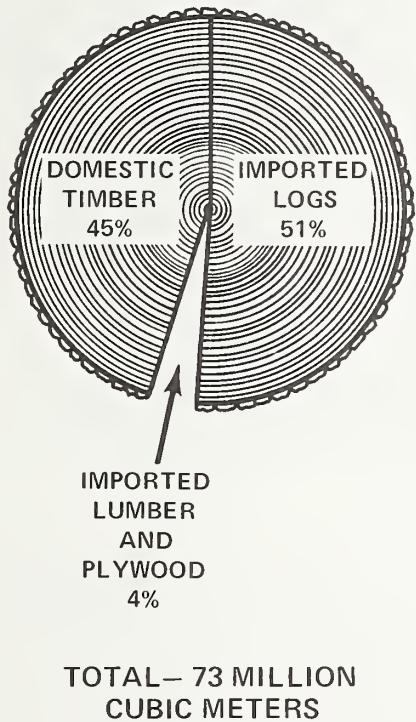


FIGURE 14

Such views are substantially different from forecasts made in 1966. These indicated that Japan would be almost 90 percent self sufficient in wood by the end of this century. The changed outlook comes partly from a more realistic view of what forestry can accomplish in a few decades. It also reflects a change in public preferences and a greater public awareness.

Since World War II, Japan has concentrated its efforts on economic growth, with unparalleled determination and glittering success. There is widespread realization in Japan today, however, that the economic growth policy has failed to bring all the blessings expected.

Kiichi Arita, Minister of the State Economic Planning Agency, summarizes some of the afterthoughts of the Japanese. "Attainment of a new welfare society represents the unanimous aspiration of the Japanese people. According to a recent survey on national preferences by the Economic Planning Agency, the Japanese people desire particularly the stabilization of prices and the protection of the environment, including the prevention and removal

of environmental disruptions. If such desires of the Japanese people are to be met adequately, it is necessary to revamp extensively institutions and practices which have been formed in the previous period of high growth." ^{15/}

That statement may be regarded as an aside as far as this report is concerned, but it is relevant here as an indication that Japan is going through a period of introspection in which both domestic and international policies are being seriously reconsidered. Changes are occurring which will have an impact on the Southeast Asian timber market.

^{15/} Kiichi Arita, Minister of the State Economic Planning Agency. Annual Economic Survey of Fiscal 1972. Tokyo, Japan. August 1, 1972.

The failure of the Japanese to reap the social gains anticipated from the rapid economic growth of recent years has resulted in a degree of disillusionment and some second thoughts. There is a rising concern about growing pollution and environmental disruption. Proper environmental protection and adequate provision for recreation and other services in the forest will encroach on the capacity of Japan's forests to produce wood. In 1966 a domestic annual timber growth goal of 132 million cubic meters was established for the year 2015. The 1973 plan calls for 94 million cubic meters by the year 2021.

The anticipated increase in timber consumption during the next 20 years rests on some bold assumptions as to Japan's ability to maintain its present economic momentum. These assumptions may prove to be optimistic. In any case, there is no doubt that the present heavy dependence on foreign timber will continue and probably increase.

Japan's mounting timber consumption has been directly related to rising income levels. The biggest factor of change has been a housing boom triggered by reduced down payment requirements and lowered interest rates in 1971. There were 23 percent more housing starts in 1972 than in 1971. The scale of the program may be judged from the fact that, although Japan has only half the population of the United States, its 1972 housing starts were 1.9 million units compared to 2.4 million units in the United States. Current plans call for building at this level through 1985.

Plans are to build 70 percent of the housing units of wood. This reportedly is partly due to the fact that concrete construction costs \$37.50 per square foot, or double the cost of wood construction.^{16/} The emphasis on wood housing is also a reflection of the traditional preference for wooden homes in Japan. The traditional Japanese home is constructed entirely of softwood (conifers), preferably Japanese cypress, and is unpainted. The construction is of the "column and beam" type. Tradition has been reinforced by a building code "requiring that all two story wood houses be framed using nothing smaller than 4-inch square one-piece wood columns from mud sill to roof plate." The intricate joint required in "column and beam" construction is difficult to make with hardwoods and is not regarded as structurally sound with hardwoods. Japan's Ministry of Construction is favoring a change in building codes to permit the adoption of the American 2x4 platform frame construction method. The Forestry Agency is developing the new standard. When it is adopted, Southeast Asia hardwoods can be substituted for softwoods as studs.

Rapidly-increasing demands for coniferous woods have caused serious supply shortages and resulted in the dramatic increases in softwood prices already noted. Building costs are said to have jumped 20 percent in late 1972. In January 1973, the price of pine boards was 69 percent above the 1971 average. Cedar boards were up 109 percent and U.S. Port Oxford Cedar logs up 184 percent (table 4).

^{16/} Engineering News Record. February 22, 1973.

Fenced out of much of the home building market, hardwood timber has not been so difficult to get in recent months. Consequently, there has been some shifting to hardwoods in other types of construction and the supply situation has tightened. The use of Southeast Asian hardwoods in construction increased 17 percent between 1970 and 1972. This, of course, has been one factor in the recent climb of hardwood log prices.

In 1971, 20.3 million cubic meters of Southeast Asian logs were imported by Japan. Imports climbed to 21.7 million cubic meters in 1972, and the Japan Southern Sea Lumber Conference forecasts that imports in 1973 will reach 23.6 million cubic meters. Typically, this is higher than earlier projections of what imports would be in 1976--22.5 million cubic meters (See appendix table 15). When the building code is changed to permit 2x4 construction in two-story homes--and it certainly will be--the earlier 1976 forecasts will be surpassed even further if the Japanese economy grows as planned.

Table 14.--1973 South Sea log demand forecast--Japan 1/

Use	January-June		July-December		January-December	
	Thous. m3	Percent change 2/ m3	Thous. m3	Percent change 2/ m3	Thous. m3	Percent change 2/ m3
Plywood	6,627	+13.9	7,708	+13.6	14,335	+13.7
Lumber	3,683	+ 6.6	4,390	+12.1	8,073	+ 9.5
Local sawmill shipment	488	+ 7.4	656	+27.6	1,144	+18.1
Total	10,798	+11.0	12,754	+13.7	23,552	+12.5

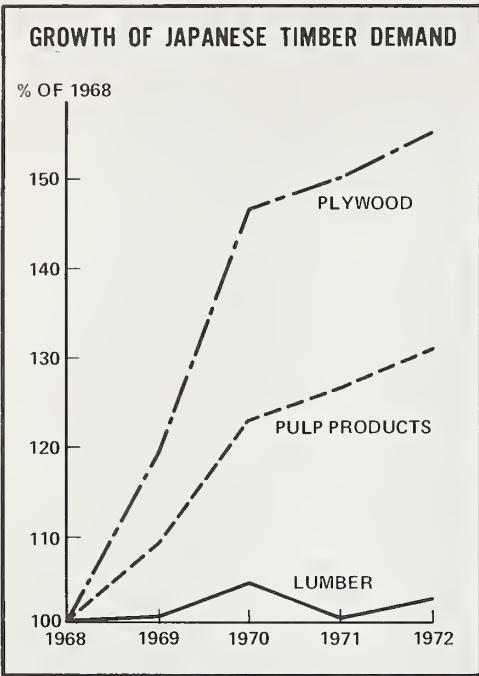
1/ From United States Embassy, Tokyo, Japan.

2/ Percent change compared with same period in 1972.

Reliable log price statistics are particularly illusive in Japan. Moreover, there is a significant difference between the delivered prices paid by the trading companies which import the logs and the so-called wholesale price of the logs sold to manufacturers. However, the previous high point in wholesale prices for logs was early 1971 when they peaked at about \$43 per cubic meter. Because of a recession in 1971, the wholesale log price declined substantially and stayed down until the latter part of 1972. The wholesale price climbed subsequently to \$58 in mid-March 1973 and is expected by the Japan Lumber Importers Association to reach \$75 per cubic meter. The price may decline from that high, but no one is expecting it to return to former levels.

Wholesale price per cubic
meter, Southeast Asian logs

High in 1971	\$43
October 1972	37
Mid-March 1973	58
Expected high	75



CHANGING CONSUMPTION PATTERNS

Japan's rising wood consumption has not been uniform among the timber products. Plywood has been the star performer. Between 1968 and 1972, the total annual consumption of plywood jumped 55 percent (figure 15). In the same period, pulp and paper consumption climbed 31 percent. These gains were not matched by lumber, as the volume of lumber used in Japan during 1972 was only 3 percent higher than in 1968. This is explained by shifts in building materials use--substitution of non-wood products for lumber and replacement of lumber by plywood for some purposes.

The above figures tell only part of the story as far as Southeast Asia is concerned. Over 90 percent of the plywood consumed in Japan is

hardwood, so the consumption of hardwood plywood has been rising almost as rapidly as total plywood consumption. The situation is quite different in the case of lumber. Consumption of softwood lumber actually dropped below the 1968 level in 1971, but consumption of lumber from Southeast Asia logs increased 38 percent in that period--nearly as much as the hardwood plywood (table 15). Softwood log imports bounced back in 1972, but domestic softwood log production has been declining steadily. It was 30 percent less in 1971 than in 1960 (appendix table 6).

Table 15.--Japan's demand for lumber and plywood, 1968-71

		Lumber		Plywood
	All	from	All	from
	lumber	Southeast	plywood	Southeast
		Asian		Asian
		logs		logs
		<u>Thousand cubic meters</u>		
1968	58,981	5,726	8,912	8,564
1969	59,534	6,456	10,597	10,326
1970	62,009	7,719	13,059	12,042
1971	59,801	7,891	13,362	12,196

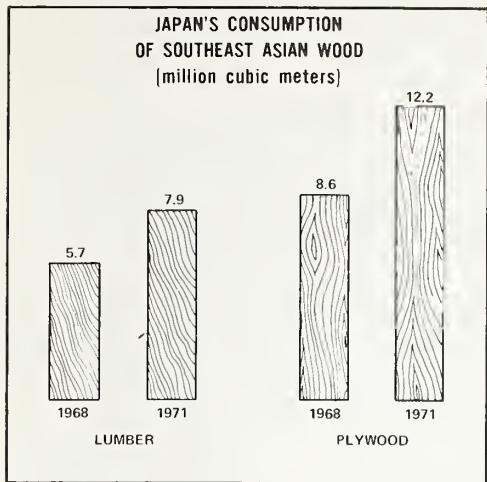


FIGURE 16

It seems inevitable that Japan's consumption of lumber and plywood from Southeast Asian logs will continue to climb at a more rapid rate than has been forecast. Softwood log and lumber imports will be more difficult to get or more expensive, or both, which will tend to force greater use of hardwoods. On the other hand, the proposed revisions of Japan's homebuilding codes should permit broader use of hardwoods (figure 16). How much the change in Japan's building codes would help improve the market for little-used tropical hardwood species will be difficult to say until there is considerably more analysis of their properties and suitabilities.

JAPAN IN THE WORLD TIMBER MARKET

Japan's economic growth has been based on a policy of importing raw materials whenever possible and doing whatever manufacturing is necessary for export or domestic consumption. Timber industry development has been remarkably successful in this regard. There is a 5 percent import duty on lauan, keruing, mersawa, and other diptero-carpaceae lumber (rough) from Southeast Asia. Other species have no duty. The plywood import duty is 20 percent, the same as in the United States. Yet, in contrast with the United States, which imports primarily processed wood products, most of Japan's wood imports have been and continue to be in raw form, that is logs, pulpwood, wood chips, and pulp. While there has been some decline in the proportion of imports in the form of logs, this has been largely offset by increasing wood chip imports (table 16).

In 1960, 97 percent of Japan's wood imports were in log form. In 1972 the percentage had dropped to 94. However, because the total volume of imports had increased greatly, imported lumber and plywood rose from 210 thousand cubic meters in 1960 to 3-1/4 million in 1972. These figures have to be discounted, however, as much of the increase in lumber and plywood imports was from Japanese owned or controlled plants overseas.

The great success Japan has had in excluding manufactured timber products has no doubt been largely due to the fact that the imports are mainly handled through a few trading companies which not only work closely with the government but become active instruments of policy implementation. "The nation's economic policy relies to a very large extent on the 'inscrutable' channels of business policy, an overview only insiders possess."¹⁷ It is perhaps significant that

¹⁷ / Japan--Dynamic Force in the Industrial World. Union Bank of Switzerland. 1972.

forestry remains one of seven industrial sectors completely closed to foreign investment.

Table 16.--Nature of Japan's timber imports, 1960-72

Year	Logs	Wood chips	Pulp and pulpwood	Subtotal	Lumber veneer	Total plywood
	<u>Percent</u>					
	:	:	:	:	:	:
	:	:	:	:	:	:
1960	88	---	9	97	3	100
1961	85	---	8	93	7	100
1962	85	---	8	93	7	100
1963	80	---	12	92	8	100
1964	82	---	11	93	7	100
1965	83	1	10	94	6	100
1966	81	2	10	93	7	100
1967	79	4	9	92	8	100
1968	77	8	7	92	8	100
1969	79	8	7	94	6	100
1970	77	9	6	92	8	100
1971	79	11	4	94	6	100
1972	78	11	5	94	6	100
:						
:						

Japan's successful exclusion of foreign-made products is the biggest single source of tension between that country and her smaller neighbors, just as it has been between Japan and the United States. In the case of the Southeast Asian timber countries, a primary problem is how to reduce the tremendous outflow of logs, amounting to more than 25 million cubic meters annually, and substitute the export of lumber, plywood, pulp, and other manufactured products which provide larger employment and income. They receive little encouragement, of course, from Japan, Singapore, Hong Kong, Korea, and Taiwan, the timber industries of which are heavily dependent upon Southeast Asian logs. Japan is the prime target for criticism because it consumes three-fourths of the logs exported from Southeast Asia. As the biggest consumer of Southeast Asian logs, Japan also receives a great deal of the blame for the essentially destructive and wasteful nature of timber development in Southeast Asia. All this, aggravated by the past highly-competitive and sometimes ruthless trade practices of the timber companies, has given Japan the reputation of not recognizing its commonality of interests with the smaller Asian countries (or at least of having a self-oriented interpretation of what these interests are).

Japan is in a strategic position and has the capacity to be most helpful in solving the timber marketing and timber development problems of Southeast Asia. How far Japan will be willing to go in

opening up its markets and meeting the criticisms that have been levelled at it is a matter of great significance to the Southeast Asian timber countries.

Japan's past, highly-protective policy toward its domestic industry has paid off handsomely in terms of economic development. There is an understandable hesitancy in deviating from that policy. Moreover, increases in imports of manufactured wood products sufficient to satisfy the timber exporting countries would require curtailment of Japanese production, with consequent economic and political dislocations. A more open system might make it more difficult to achieve Japan's long-run objective of greater self sufficiency in wood supply. A major reason for the close controls on timber imports apparently has been to encourage timber growing in Japan by making it more profitable.

DEVELOPING DESIRABLE TRADE RELATIONS WITH JAPAN

Japan is in the agony of introspection and change. It is important, therefore, that Vietnam and the other Southeast Asian countries use the full power of their leverage and negotiation to achieve the kind of change that will increase and maintain the economic contribution of their timber resources.

A most important and encouraging development was the Japanese Cabinet Decision of February 16, 1973.^{18/} This far-reaching decision represents unequivocal recognition of the timber supply problems that lie ahead and establishes a policy framework for dealing with these problems. The statement points out that "...it is further to be imagined that wood materials will become a short supply material due to the increase on a world scale of the demand for wood materials and to the diminution that accompanies this in the absolute amount of the forest resources. So it may be expected that no optimism will be permissible as to the maintenance of or amount of supply of wood materials such as is required by our country." Since Japan has more experience than any other country in searching for raw materials, this is a particularly significant statement.

By word and action, the Japanese have expressed grave concern over the possibility that the flow of logs from the U.S. West Coast will be stopped or drastically curtailed. Logs from America were one-fourth of the log volume imported by Japan in 1972 (appendix table 7.) The alarm at the thought of losing this supply is in part caused by the premium value of American Softwoods. It also reflects the fact that Japan doesn't have many options as far as timber sources are concerned. Any loss of sources or increases in demand should further stimulate the market for Southeast Asian timber and improve opportunities for selling secondary species.

18/ Basic Plan Relating to Forest Resources and Long-Term Forecasts Relating to the Demand for and Supply of Important Forest Products. Japan Cabinet Decision of February 16, 1973.

The Japanese Cabinet acknowledged in the previously mentioned document the needs and aspirations of the Southeast Asian countries. "...in addition to striving for an appropriate importation of foreign materials, while paying adequate attention to such things as the social and economic conditions in the producing countries, it is necessary over the long term to pay attention to such things as co-operating in the cultivation of the forest resources of the producing area countries." This policy statement is a big step forward in that it accepts a principle that provides a satisfactory basis for negotiation with Vietnam and other Southeast Asian timber countries.

One thing seems clear--Japan will have even greater need for Southeast Asian wood in the future than in the past. It can perhaps relieve its supply situation somewhat by switching to non-wood materials in certain instances. But, in a world in which all resources are becoming scarcer, there are limits to how much can be done along that line. Japan can perhaps delay the shrinking of its soft-wood log imports from North America, but it faces an uphill battle getting as much softwood timber as it might like to have during the next several decades. It can, and apparently attends to, go to the root of the problem by stepping up domestic timber growing programs, but this will take time too. In other words, none of Japan's options appear to preclude continued and growing dependence upon Southeast Asian timber.

This rosy view is clouded by the difficulties that lie ahead in getting the timber trade on a basis that isn't almost exclusively on Japan's terms. There will have to be compromises between what is best for Southeast Asia and what is best for Japan.

The issue, then, is how the Southeast Asian timber countries can take advantage of an improved bargaining position to secure a better trade relationship (i.e., reduced log exports and larger exports of lumber, plywood, and pulp). This may not be the hopeless task it was a few years ago, partly because changes of attitude are taking place in Japan. Chujiro Fujino, Mitsubishi Corporation President, presents the enlightened view very effectively:

"Our country depends on other countries for the supply of practically all important natural resources because it does not have such natural resources. However, it seems to me natural for countries producing resources to try to process such natural resources, even a little, to increase the value of their exports. Many countries have already expressed the desire to refine ores or process other natural resources by themselves and export them in the form of semi-finished products in an effort to develop their own industries.

"I think that Japan should listen to such demands and cooperate with them in their efforts for industrialization

and help them foster export industries. It should also promote its cooperation in the form of importing semi-finished and finished goods by opening Japanese markets to them.

"Japan should offer its economic cooperation in such a way as to contribute to the economic development of a recipient nation, as mentioned by the recommendation (U.N. Conference on Trade and Development). In the past, Japanese economic cooperation tended to give consideration to efforts to (of) Japanese enterprises to seek profits, and this sometimes resulted in inviting criticism from aid-receiving countries..."^{19/}

Summarizing, Japan's economic presence in Southeast Asia will remain overwhelming and cannot be ignored in plans of any developing country in the region.

There is still reason for worry that Japan will continue to "submerge all that is good for Asia beneath an overwhelming pre-occupation with what is good for Japan"^{20/} And it is perhaps too much to expect Japan to become a completely benevolent giant. But, like the first blossoms of a Japanese spring, there are early signs of a desire in that country to change the direction of both internal and external policies. Improvements in trade with Japan are possible today that could not have been achieved a year ago. Japan has the prime interest among the "big powers" in the well-being and stability of Southeast Asia. It has the economic capacity and the technical forestry capability to be of great assistance. As already mentioned, there are many Japanese who clearly see the need for greater cooperation with, and assistance to these countries. There have been unofficial suggestions that Japan and the United States jointly help develop forestry programs in Southeast Asia.

One hopeful aspect is that, if Japan has demonstrated anything in recent decades, it is the "capacity to transform."

DEVELOPING A MARKETING STRATEGY FOR VIETNAM TIMBER

About one-third of the Republic of Vietnam is forested--6.4 million hectares. Notwithstanding whatever war damage has occurred, the timber in the forests can contribute to Vietnam's economic recovery. The short-run goal of producing \$15 million in foreign exchange annually plus \$20 million in products for domestic use should be readily attainable.^{21/} The long-run goal (1974-1977) "to develop strong efficient

^{19/} Japan Times. January 24, 1973.

^{20/} Joseph Z. Reday. Asia Magazine. Tokyo, Japan. March 4, 1973.

^{21/} Post-War Reconstruction Plan--Agriculture, Fishery, Forestry. Government of the Republic of Vietnam, Ministry of Land Reform, Agriculture, Fishery and Animal Husbandry Development. February 1972.

wood-using industries capable of producing wood product exports valued at 100 million U.S. dollars annually" may be reached, but not sustained, without careful planning. In other words, it may be easy to sell timber, but skill and patience will be required to develop a permanent, stable forestry enterprise that continues to contribute substantially to the income and welfare of the country.

The timber development problems facing Vietnam are not unique. Every other tropical country that has extensively developed its forests has faced these problems with only minimal or partial success. Failure of these countries to extract as much benefit from the forests as they might is directly attributable to four factors:

- . Overcutting--logging at a rate that cannot be sustained. This is a common failing that arises partly from lack of interest in long-term productivity and partly from over-optimistic estimates of the capacity of the forests to produce. The ultimate result of overcutting is reduced productivity and revenues. A more immediate effect that seems to have been largely overlooked is that, in the rush to get into the timber business, overcutting has resulted in over-production. There is hardly any doubt that timber profits have been lower than necessary in recent years because of overproduction.
- . Undue selectivity of species--concentrating on a few favored species to the exclusion of less well-known or less desirable ones. Such high grading has resulted in wasted wood because of logging damage; it eventually changes the character of the forest to something less desirable. This problem is likely to be more serious in Vietnam than in Indonesia and the other major Southeast Asian timber countries where many of the timber stands contain 50 to 90 percent of the popular lauan-type species.^{22/} In the absence of inventory information, it is difficult to speak positively about the Vietnam forests; however, it appears that the Vietnamese forests are not the typical lauan forests, and that the individual stands may be less uniform with regard to wood characteristics. If this is true, the problems of selective use may be more critical than in other countries.
- . Absence of sound forestry programs--efforts to regenerate the forests and manage the timber. Million of hectares of forest land have been logged throughout the tropics, but there has been relatively little forestry to match the cutting. As a result, much of the cutover land has become essentially nonproductive, and much is producing usable timber at only a fraction of its potential capacity.

^{22/} Russell C. Stadelman. Hardwood Timber Supply - Southeast Asia. Conference on Tropical Hardwoods, College of Forestry, Syracuse University. August 1969.

A conference of Southeast Asian countries in Bangkok, Thailand, in January 1973 noted that, "...given these (recent) demand patterns, technological conditions and commercial realities, the dipterocarp (lauan) forests of Southeast Asia are probably the most valuable tropical hardwood resources of the large three remaining blocks of tropical hardwood forests in the world today--the other two being the Amazon basin and West Africa. Should indiscriminate logging and extensive cutting of valuable species take place to meet the ever-growing demands of the consumer countries--without forest regeneration or reforestation--the most valuable tree species could soon disappear with many of the logged over areas becoming degenerated forest."²³

Knowledge of tropical forestry is extremely inadequate, but this is hardly an excuse. In the rush to sell timber, regeneration of the forest and timber management have received very little attention.

Heavy concentration on log exports--selling logs instead of processed products. Each Southeast Asian timber country aspires to processing most of its own logs, but only West Malaysia has had much success in achieving that objective. A number of factors account for the lack of success elsewhere. Taiwan and Korea have been unwilling to relinquish the benefits from their timber businesses, which are almost entirely built on log imports. Japan has extracted maximum economic gain by importing raw materials--that is, logs--and is hesitant about making any change.

These countries have in effect stood between the consumers and the timber growing countries, making it difficult to attract new industrial plants. The problem has been aggravated by the fact that some would-be investors are reluctant to invest in the generally less-stable economic environment of the developing countries.

Some of these problems may not seem like marketing problems, but they are to the extent that the marketing policy holds the key to solving them.

Korea, Taiwan, and Japan--and other countries as well--are expressing growing interest in timber concessions in Southeast Asia. Their interest, of course, is in securing long-range timber supplies to protect industrial investments and to assure the filling of wood requirements. But cutting rights could be granted contingent upon assistance in 1) developing forestry programs on a par with those planned in Japan and Taiwan; 2) outlining timber cutting budgets that are in balance with these programs; and 3) establishing programs for more complete utilization of species. Access to timber supplies could also be dependent on obtaining some reasonable balance between the logs exported and those manufactured locally.

²³/ From a press release issued January 12, 1973.

If the mistakes that other countries have made in timber development in the past are to be avoided, timber marketing must be used as the lever to obtain proper timber industry and forestry development. This is not unreasonable. As already mentioned (page 32), suggestions for this type of cooperation have come from Taiwan.

In October 1972, the Forestry Agency of Japan prepared a paper on "Economic Cooperation Through Development of Forest Resources." It is significant as evidence of evolving attitudes in Japan. Its basic premises are that Japan has a responsibility to help the developing countries, and that, as a major consumer of wood, one of these responsibilities is to help establish forestry programs which assure continuing wood supplies, sound land use, and environmental protection.

The proposal, outlined only in the broadest of terms, would be to establish an Overseas Agricultural and Forestry Development Cooperation Agency to provide technical assistance and financial backing to carefully integrated forestry and industrial development programs. The idea received general endorsement in the Japanese Cabinet Decision of February 16, 1973. ^{24/}

To the extent that it can act decisively, Vietnam can accomplish some of these objectives by itself. In the long run, though, more will be gained if the Southeast Asian wood-producing countries work together to develop common policies and programs.

THE MARKETABILITY OF VIETNAMESE FOREST SPECIES

There are hundreds of tree species in Southeast Asia, but the overwhelming attraction has been the lauans--also known as Philippine mahogany, Malaysian hardwoods, meranti, and other names. These species (of which there are eight in Vietnam--see table 17) brought timber industry development to Southeast Asia and have largely sustained it. For example, 92 percent of Japan's hardwood plywood is lauan. Among the non-lauan woods, the dipterocarpus species (apitong, dau, keruing) have enjoyed a fairly good market, and ramin has been a best seller. However, most of the other species have been only lightly used.

Development of the hardwood forests of the Philippines, Malaysia, and Indonesia has been spurred by the fact that, in addition to having characteristics generally regarded as desirable, the lauans are abundant. Unlike the more heterogeneous tropical forests of Africa and the Amazon, there are heavy stands containing a high percentage of lauan, thus reducing development and logging costs.

^{24/} See footnote, page 41.

Table 17.--"Lauan" species in Vietnam

Botanical name	Vietnamese name	Malaysian name
:	:	:
<i>Shorea cochinchinensis</i>	: sen mu	balau, meranti, seraya
<i>Shorea hypochra</i>	: bo bo	balau, meranti, seraya
<i>Shorea obtusa</i>	: ca chac	balau, meranti, seraya
<i>Shorea talura</i>	: sen mu	balau, meranti, seraya
<i>Shorea vulgaris</i>	: chai	balau, meranti, seraya
<i>Parashorea stellata</i>	: cho chi	gerutu gerutu, meranti, seraya
<i>Parashorea lucida</i>	: cho chi	gerutu gerutu, meranti, seraya
<i>Parashorea densiflora</i>	: cho chi	gerutu gerutu, meranti, seraya
:	:	:

Lauan logs are generally large and easy to peel and work; the wood is lightweight, soft, uniform texture, and dimensionally quite stable. Not the least of lauan's attributes is that most logs will float. This has been particularly important because much of the logging in Southeast Asia is in roadless or nearly roadless areas, requiring that the logs be floated to shipside.

This isn't to say that all lauan is equally desirable; lauans vary considerably in their properties. White meranti allegedly has a high silica content and yellow meranti can't be used for concrete forms because it inhibits the curing of the cement. Philippine lauan is heavier and harder than Indonesian lauan; it can be used for lumber, whereas Indonesian lauan is primarily suited for plywood. There are variations among species and variations according to latitude and altitude. Trees grown further north are denser and heavier. Timber grown between 500 and 2,000 feet elevation tends to be superior to lower-grown timber because it has fewer defects. It also tends to be superior to higher-elevation timber because it isn't so hard and brittle. Trees grown in monsoon-prone areas are less desirable because they tend to be twisted.

Much of the lack of popularity of many other species can be attributed to inadequate information, market preferences, and other factors which have no particular relation to the qualities of these species. In other words, many of the under-utilized species have a market potential that hasn't been exploited. Much more information is needed before we can judge how great that potential is, though; for example, new species are periodically being "discovered" to have desirable features and are brought into the market. FAO has published a list of 78 species and species groups in the Far East and Near East that are suitable for plywood (see Appendix B); 32 grow in Vietnam.

There has been a tendency to ignore the secondary species because the supply of proven species has been sufficient to satisfy needs. Only since some of the established species have become less abundant has more serious attention been given to the others.

Because the Japanese wood demands are so large, wood preferences in that country have had much to do with shaping the market. The traditional Japanese home is of "post and beam" construction with softwoods. The insistence on softwoods has tended to curtail the market for hardwoods that could be used for structural purposes. Japan's housing boom has reached such proportions that it seems likely that the softwood supply-price situation will reach the point where demands for structural hardwoods in Japan will increase substantially.

A significant factor in the unbalanced utilization of Southeast Asia's hardwood timber is the incompleteness of information about the resource. Data on timber volumes is sparse. But equally important is the shortage of information about strength, density, color, texture, etc., of many timber species. While a few species are well documented and there are bits and pieces of information about others in various countries, no technical information at all is available about many kinds of trees. Timber dealers have been reluctant to promote attractive new species that come to their attention when they know little about the supply and its technical and technological characteristics.

It cannot be proven that the lack of a catalog of species' properties has prevented the use of any species, but the spottiness of the data has certainly played some part in the failure to develop systematic programs to develop the tropical forests. One of the most constructive steps that could be taken would be to establish an international program to gather such data, and to follow that with an effort to publicize the lesser-known species and their attributes. In the absence of such an overall attack on the problem, improvements in utilization will continue to come in a piecemeal fashion.

Most of the Vietnamese woods are sinkers. In the past this has been regarded as a handicap. In localities where the road system is inadequate and log transportation has to be by water, logs that sink are expensive to handle and are generally left behind for that reason. But this disadvantage may be more apparent than real. What the opportunities really are cannot be determined until more complete information is available on the volume and properties of the timber.

THE OPPORTUNITY FOR FURNITURE MANUFACTURE IN VIETNAM

Furniture and woodenware manufacture is an old-line industry in the Far East. Today there are 40 furniture factories or shops in Singapore and about 400 in Taiwan alone. It is difficult to say, on the basis of a cursory look, how much opportunity there is for an export furniture industry in Vietnam. But all signs indicate that there is a good opportunity. The United States market for furniture is large and one expert, at least, sees the demand for fine furniture increasing. There is also a considerable market potential in Japan, as the demand for consumer goods there keeps rising. If housing continues to be built at the present rate in Japan, there will be increasing need for both Eastern and Western-type furniture. The issue

in this case will be the willingness of the Japanese Government to open this market to other Asian countries.

Furniture plants are currently being built in Asia. This is perhaps the best indication that there is a growth potential. One of the more desirable features of the furniture industry is the diversity of opportunity it provides. Furniture can be produced in small shops or large factories. There is a market for small wooden items, furniture parts and furniture of all varieties and values. One plant in Singapore produces 2,500 standard items of modern furniture. Another specializes in drawer pulls and moldings.

There appears to be more interest in new sources of wood and new woods among the larger and more progressive furniture makers than among other parts of the timber industry. One Singapore plant manager expressed interest in seeing samples of more than a dozen Vietnamese species:

Go-mat, *Sindora cochinchinensis*
Ven-ven, *Anisoptera spp.*
Ca-chak, *Shorea obtusa*
Sen, *Bassia pasquieri*
Chai, *Alphonsea spp.*
Kien-kien, *Hopea pierrei*
Trac, *Fagraea pagrana*
Dang-huong, *Pterocarpus pedatus*
Dau, *Dipterocarpus spp.*
Cam-xa, *Xylia dolabriformis*
Cho-chi, *Parashorea spp.*
Huynh, *Tarrietia cochinchinensis*
Gioi, *Michelia bariensis*
Chieo-lieo, *Terminalia spp.*
Cam-lai, *Dalbergia bariensis*
Son, *Melanorrhea laccifera*

Manufacture of furniture and related items for export appears to be worthy of careful consideration by Vietnam. Vietnam has the timber. It has the low-cost labor supply which is vital to an essentially labor-intensive industry. It has a number of people with the necessary basic skills.

Before inviting any investment in Vietnam furniture factories, expert counsel and technical advice should be sought from furniture experts thoroughly familiar with the international market. This may avoid costly mistakes. What items and models are likely to be most profitable? What kind of marketing arrangement would be most desirable? Would it be better to make the furniture locally or to produce parts for assembly at points closer to the consumers? What modifications of local practices and manufacturing processes will be necessary to produce for export trade?

Following the Korean War, Taiwan sent technicians to Korea to help set up a furniture plant financed by American capital. They

also trained the Koreans in the operation of this plant. This type of technical advice on furniture design, production, and marketing would be invaluable in planning for developments in Vietnam. It is the type of technical assistance that Taiwan and perhaps other countries can provide.

APPENDIX A--LOG SHIPPING COSTS

Steamship operating costs set the general level of ocean freight charges. These are affected by such factors as size of vessel and the amount of cargo to be loaded or unloaded at a particular port. Within the range set by operating costs, shipping charges may be either high or low depending on the availability (the shortage or abundance) of ships during any particular period. Log transport costs from Southeast Asia can be affected by such diverse factors as the wheat shipments from the United States to Russia and the state of Japanese ship building programs. It is for these reasons that there is some variation in the rates quoted. However, Appendix table 1 gives a general rate picture; rates run from \$6 to \$7 per cubic meter from the Philippines to Taiwan to more than \$13 from Sumatra to Japan.

The April 10, 1973 issue of the Japan Lumber Journal quotes very similar rates from Kalamantan, Sarawak, and Sumatra to Japan, pointing out that they are calculated at the rate of exchange of 300 yen per U.S. dollar. At 265 yen per dollar, the rate in U.S. dollars is actually 13.2 percent higher than shown.

Appendix table 1--Typical log transport rates

From	To		
	Japan	Korea	Taiwan
<u>U.S. dollars per cubic meter</u>			
Philippines	8.00- 9.00	8.00- 9.00	6.00-7.00
Sarawak and Sabah	9.00-11.00	9.00-11.00	7.00
Kalamantan	11.00-12.00	11.00-12.00	8.00
Sumatra	12.50-13.50	12.50-13.50	8.00

Other handling charges vary from port to port.^{25/} Following were the additional costs in the port of Tokyo prior to the February 1973 currency reevaluation (per cubic meter).

^{25/} Loading and port charges are included in the shipping costs.

Unloading and rafting	\$0.76
Unrafting	.42
Holding area	.39
Disinfection	.25
Botanical inspection	.07
Storage	.20

Insurance about 0.5 percent of f.o.b. log price.

APPENDIX B--WOOD SPECIES USED FOR PLYWOOD

Appendix table 2.--Wood species used in plywood manufacture--
Far and Near East

Botanical name	Common name	Vietnamese name
ANACARDIACEAE	:	:
<i>Campnosperma auriculata</i>	: Terentang	:
<i>Dracontomelum dao</i>	: Dao	:
<i>Lannea coromandelica</i>	: Jhingan	:
<i>Mangifera altissima</i>	: Pha	:
<i>Mangifera indica</i>	: Mango	:
<i>Manfigera spp.</i>	: Machang	: Xoai hoi, Xoai gueo
<i>Parishia insignis</i>	: Red chup	:
<i>Spondias spp.</i>	: Hog plum	: Coc gao, Coc chua
<i>Swintonia floribunda</i>	: Civit	:
ANONACEAE	:	:
<i>Polyalthia fragrans</i>	: Debda	:
APOCYNACEAE	:	:
<i>Alstonia scholaris</i>	: Shaitan	: Mop, Mo cua
ARALIACEAE	:	:
<i>Kalopanax ricinifolium</i>	: Sen	:
BETULACEAE	:	:
<i>Alnus glutinosa</i>	: Alder	:
* <i>Betula spp.</i> <u>l/</u>	: Birch	:
BOMBACEAE	:	:
<i>Bombax spp.</i>	: Bombax, kapokier,	: Gao, Goa
CULLENIACEAE	:	:
<i>Cullenia integenima</i>	: Korani	:
<i>Kydia calycina</i>	: Pula	:
<i>Salmalia spp.</i>	: Semul	:
BURSERACEAE	:	:
* <i>Aucoumea klaineana</i>	: Okoume, gaboon	:
<i>Boswellia serrata</i>	: Salai	:
<i>Canarium spp.</i>	: Dhuys, kedondong	: Ca na, Cham

--Continued

Botanical name	Common name	Vietnamese name
CAESALPINIACEAE	:	:
Sindora spp.	: Sepetir	: Gu, Go mat
CASUARINACEAE	:	:
Casuarina spp.	: Casuarina	: Ru
CELASTRACEAE	:	:
Lophopetalum wrightianum	: Mata ulat	: Ba khia
CERCIDIPHYLLOACEAE	:	:
Cercidiphyllum japonicum	: Katsura	:
COMBRETACEAE	:	:
Terminalia ajurna	: Arjun	:
Terminalia belerica	: Bahera	:
Terminalia bialata	: White chuglum	:
Terminalia copelandii	: Lanipau	:
Terminalia procera	: Badam	:
Terminalia tomentosa	: Laurel	: Cam lien
Terminalia spp.	: Kalumpit	: Bang, Chien lien
DATISCACEAE	:	:
Octomeles sumatrana	: Erima, bimuang	:
Tetrameles nudiflora	: Kapong, maina, baing	: Tung
DILLENIACEAE	:	:
Dillenia spp.	: Chalta	: So
DIPPTEROCARPACEAE	:	:
Anisoptera spp.	: Anisoptera	: Ven ven
*Dipterocarpus spp.	: Apitong, gurjun, : keruing, yang	: Dau
*Hopea spp.	: Selangan, giam, tak, : takien, thingan	: Sao, Sang dao, : Kien kien
*Parashorea malaanon	: Bagtikan, white : seraya	:
*Parashorea spp.	: Gerutu, Philippine : mahogany	: Cho chi
*Pentacme contorta	: White lauan	:
Shorea assamica	: White meranti	:
*Shorea negrosensis	: Red lauan	:
Shorea polysperma	: Tangile	:
*Shorea spp.	: Meranti, seraya, sal, : lauan, Philippine : mahogany	: Ca chac, Sen mu, Chai, : Bo bo
EBENACEAE	:	:
Diospyros spp.	: Ebony	: Mun, Thi, Sang den, : Cam thi

--Continued

Botanical name	Common name	Vietnamese name
EUPHORBLACEAE	:	:
Endospermum spp.	: Bakota	: Vang trang
Trewia nudiflora	: Pitali	:
FAGACEAE	:	:
Fagus crenata	: Japanese beech	:
Quercus crispula	: Japanese oak	:
Quercus robur. Q. petraea	: European oak	:
Quercus castaneaefolia	: Persian oak	:
Quercus spp.	: Oak	: Bot, Gie, Soi
GONYSTYLACEAE	:	:
Gonostylus spp.	: Ramin	:
JUNGLANDACEAE	:	:
Juglans regia	: Persian walnut	:
LAURACEAE	:	:
Machilus thunbergii	: Laurel	: Vang ve
Phoebe spp.	: Bonsum	:
LYTHRACEAE	:	:
Duabanga sonneratiaeides	: Phay	:
Lagerstroemia spp.	: Bang-lang	: Bang Lang
MAGNOLIACEAE	:	:
Michelia champaca	: Champ	: Gioi
MELIACEAE	:	:
Amoora wallichii	: Amari	:
Cedrela toona	: Toona	:
Chukrasia tabularis	: Chickerassy	: Lat hoa, Chua ket, Nao,
Dysoxylum malabaricum	: White cedar	: Huynh duong
MIMOSACEAE	:	:
Acrocarpus fraxinifolius	: Mundani	:
Albizzia lebbeck	: Kokko siris	: Sua, Ban xe, Chua
MORACEAE	:	:
Artocarpus chaplasha	: Chaplash	: Mit nai
SIMARUBACEAE	:	:
Ailanthus spp.	: Tree. of heaven	:
STERCULIACEAF	:	:
Sterculia foetida	: Sterculia	: Vang, Voi, Trom
Tarrietia spp.	: Mengkulang	: Huynh, Cui
*Triplochiton scleroxylon	: Obeche, wawa	:

--Continued

Botanical name	Common name	Vietnamese name
THEACEAE	:	:
Schima wallichii	: Chilauni	:
TILIACEAE	:	:
Tilia spp.	: Basswood	:
ULMACEAE:	:	:
Celtis nymanii	: Celtis	:
Holoptelea integrifolia	: Kanju	:
Ulmus spp.	: Elm	:
VERBENACEAE	:	:
Gmelina arborea	: Gamari	:
Tectona grandis	: Teak	: Gia ty
	:	:
	:	:

1/ Species that are regularly used in quantity are indicated by an asterisk (*).

Compiled by the Food and Agriculture Organization of the United Nations.

APPENDIX C--SPECIES NATIVE TO VIETNAM

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera and species

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Acacia farnesiana</i>	Keo		4	
<i>Acronychia laurifolia</i>	Bi bai		4	
<i>Adina cordifolia</i>	Gao vang		3	
<i>Adina polyccephala</i>	Dang de		4	
<i>Aegle marmelos</i>	Bau Nau		4	
<i>Aglaia gigantea</i>	Goi		3	.75
<i>Albizia lebbekoides</i>	Sua	Passak	4	
<i>Albizia lucida</i>	Ban xe	Betawai	3	
<i>Albizia stipulata</i>	Chua	Betawai	3	.63
<i>Alphonsea</i> spp.	Chai	Karai		.40
<i>Alstonia scholaris</i>	Mo cuu	Pulai	4	
<i>Alstonia spathulata</i>	Mo cuu	Pulai	4	
<i>Anomum cardamomum</i>	Dau khau		4	
<i>Anisoptera</i> spp.	Ven ven	Mersawa		
<i>Anisoptera cochinchinensis</i>	Ven ven	Mersawa	3	
<i>Anisoptera glabra</i>	Ven ven	Mersawa	3	
<i>Anisoptera oblonga</i>	Ven ven	Mersawa	3	
<i>Anisoptera scaphula</i>	Ven ven	Mersawa	3	
<i>Anogeissus vulgaris</i>	Ram		4	
<i>Anthocephalus cadamba</i>	Gao	Laran		
<i>Antiaris toxicaria</i>	Sui	Terap		
<i>Apodytes giung</i>	Chim chim			
<i>Artocarpus asperula</i>	Mit nai	Keledang	3	
<i>Artocarpus hirsuta</i>	Mit nai	Keledang	3	
<i>Artocarpus integrifolia</i>	Mit nai	Keledang	2	
<i>Avicennia</i> spp.	Mam	Api api		.67
<i>Bassia pasquieri</i>	Sen		2	
<i>Bauhinia variegata</i>	Bang		4	
<i>Bischofia javanica</i>	Nhoi	Tuai	4	
<i>Bombax malabaricum</i>	Goa	Kekabu hutan	4	
<i>Brownlowia densysiana</i>	So do		2	
<i>Bruguiera</i> spp.	Vet	Berus	4	
<i>Caesalpinia pulcherrima</i>	Diep		4	

Continued--

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Calophyllum</i> spp.	Cong	Bintangor	3	.65
<i>Calophyllum inophyllum</i>	Mu u	Bintangor	4	.60
<i>Canarium album</i>	Ca na	Kedondong	4	.55
<i>Canarium nigrum</i>	Cham	Kedondong	4	
<i>Carallia</i> spp.	Sang vi	Meransi	4	
<i>Carallia lucida</i>	Sang ma, tia	Meransi	4	
<i>Careya arborea</i>	Vung	Dinh huong	4	
<i>Caryophyllum aromaticus</i>	Dinh huong	Maung	3	1.12
<i>Cassia siamea</i>	Maung trang	Ca oi	1	.61
<i>Cassia tonkinensis</i>	Ca oi	Berangan	4	.73
<i>Castanopsis indica</i>	Ca oi	Berangan	2	.73
<i>Castanopsis tribuloides</i>	Duong lieu	Ru	2	
<i>Casuarina equisetifolia</i>	Da	Tengar	4	
<i>Ceriops</i> spp.	Lat hoa	Repoh	2	.82
<i>Chukrassia tabularis</i>	Re huong	Medang	3	.64
<i>Cinnamomum</i> spp.	Ra huong	Medang	1	.80
<i>Cinnamomum camphora</i>	Go 'huong	Medang	2	
<i>Cinnamomum illlicioides</i>	O duoc	Medang	4	
<i>Cinnamomum zeylanicum</i>	Hau phat	Medang	4	
<i>Cinnamomum iners</i>	Chungbau	Medang	4	
<i>Combretum quadrangulare</i>	Oi rung	Mempat	4	.75
<i>Cratoxylon polyanthum</i>	Lanh nganh	Mempat	4	
<i>Cratoxylon formosum</i>	Loi			
<i>Crypteronia paniculata</i>	Samou			
<i>Cunninghamia sinensis</i>	Ca duo'i	Sempilor	1	.45
<i>Cyano daphne cuneata</i>	Hoang dang			
<i>Dacrydium elatum</i>	Cam lai			
<i>Dalbergia barriensis</i>	Trac			
<i>Dalbergia cochinchinensis</i>	Xoay			
<i>Dillenia aurea</i>	So	Keranji	1	.10
<i>Dillenia elata</i>	So	Simpoh	2	.15
<i>Diospyros lucida</i>	Sang den	Kayu melam	4	

Continued--

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Diospyros mun</i>	Mun	Kayu melam	1	2
<i>Diospyros rubra</i>	Thi	Kayu melam	1	84
<i>Diospyros siamensis</i>	Cam thi	Kayu melam	1	.66
<i>Dipterocarpus spp.</i>	Dau	Keruing	3	
<i>Dipterocarpus alatus</i>	Dau con rai	Keruing	3	
<i>Dipterocarpus dyerii</i>	Dau	Keruing	3	
<i>Dipterocarpus hasseltii</i>	Dau	Keruing	3	
<i>Dipterocarpus intricatus</i>	Dau long	Keruing	3	
<i>Dipterocarpus obtusifololius</i>	Dau tra beng	Keruing	3	
<i>Dipterocarpus tonkinensis</i>	Cho nau	Keruing	3	.60
<i>Dipterocarpus tuberculatus</i>	Dau dong	Keruing	3	
<i>Dolichandrone rheedii</i>	Quao		4	
<i>Dubanga sonneratiooides</i>	Phay	Berembang bulkit	4	
<i>Dysoxylum loureirii</i>	Huymh duong		4	.79
<i>Elaeocarpus tomentosa</i>	Chang chang	Kungkurađ	3	
<i>Endospermum sinense</i>	Vang trang	Sesendok	4	
<i>Engelhardtia chrysolepis</i>	Cheo	Pa.al	3	.58
<i>Eriodendron anfractuosum</i>	Gon		4	
<i>Eriemannthus indochinensis</i>	Mop		4	
<i>Erythrina indica</i>	Ngo dong		4	
<i>Erythrophloeum fordii</i>	Lim		2	.90
<i>Eucalyptus spp.</i>	Bac ha		3	
<i>Eucalyptus robusta</i>	Bac ha		3	
<i>Eucalyptus rostrata</i>	Bac ha		3	
<i>Eucalyptus saligna</i>	Bac ha		3	
<i>Eugenia spp.</i>	Tram	Kelat	3	.80
<i>Eugenia tinctoria</i>	Sang	Kelat	3	
<i>Euphorbia longana</i>	Nhan rung		4	
<i>Excoecaria agallocha</i>	Gia		4	
<i>Fagraea fragrans</i>	Trai		4	
<i>Ficus spp.</i>	Sung		1	
<i>Fokienia hodginsii</i>	Pemu		1	
<i>Fokienia kawai</i>	Pemu		1	

Continued--

Appendix table 3.-Species native to Vietnam, arranged alphabetically by botanical genera and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Garcinia fogliaoides</i>	Trai li	Kandis	2	1.01
<i>Garcinia ferrea</i>	Roi	Kandis	3	
<i>Garcinia loureiri</i>	Bua	Kandis	4	
<i>Garuga pinnata</i>	Dau heo	Kedondong	4	
<i>Gelonium multiflorum</i>	Ngong tau	4		
<i>Gironniera sinensis</i>	Ngut	4		
<i>Hevea brasiliensis</i>	Cao su	Para rubber	4	
<i>Homalium dictyoneurum</i>	Mnut	4		
<i>Homalium meliosia</i>	Song	Merawan	2	.71
<i>Hopea dealbata</i>	Sao	Merawan	3	.86
<i>Hopea ferrea</i>	Sang dao	Merawan	2	.85
<i>Hopea odorata</i>	Sao	Merawan	3	.87
<i>Hopea pierrei</i>	Kien kien	Merbau		
<i>Intsia</i> spp.	Gu muoc	Pauh kijang	3	
<i>Irvingia oliveri</i>	Cay	Engiran burrong	4	
<i>Ixonanthes cochinchinensis</i>	Nu	Penarahan	3	.87
<i>Ketesteeria davidi ana</i>	Ngo tung	Penarahan	4	
<i>Knema conferta</i>	Mau cho	Penarahan	3	
<i>Knema corticosa</i>	Sang mau	Bungor	2	
<i>Lagerstroemia</i> spp.	Bang lang			
<i>Laurus camphorata</i>	Chuong			
<i>Liquidambar formosana</i>	Thau			
<i>Litsea</i> spp.	Vu	Medang	4	.77
<i>Litsea vang</i>	Boi loi	Medang	3	.59
<i>Lophopetalum duperreanum</i>	Sang trang	Perupok	4	.56
<i>Lophopetalum wightianum</i>	Ba khia	Perupok	4	
<i>Lumnitzera coccinea</i>	Coc	Teruntum	4	
<i>Lysidice rhodostegia</i>	My			
<i>Machilus trijuga</i>	Vang ve			
<i>Mallotus cochinchinensis</i>	Vang	Mahang	2	
<i>Mangifera foida</i>	Xoai queo	Machang	4	.40
<i>Mangifera indica</i>	Xoai hoi	Machang	3	.67
<i>Manglietia glauca</i>	Mo vang tam	Machang	3	.41

Continued--

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera
and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Markhamia stipulata</i>	Dinh		2	.67
<i>Melaleuca leucadendron</i>	Tram	Gelam	4	.75
<i>Melanorrhea laccifera</i>	Son	Rengas	1	.89
<i>Melia azaderach</i>	Xoan	Sentang	3	.53
<i>Memecylon spp.</i>	Sam		4	
<i>Mesua ferrea</i>	Vap	Penaga	2	1.05
<i>Michelia bariensis</i>	Gioi		4	
<i>Morinda tinctoria</i>	Nhau		4	
<i>Morus indica</i>	Giau		4	
<i>Nephelium litchi</i>	Vai		4	
<i>Osmanthus fragrans</i>	Hue moc		1	.80
<i>Pahudia cochinchinensis</i>	Go do	Mergau	1	
<i>Parashorea spp.</i>	Cho chi	Gerutu gerutu	2	.75
<i>Parashorea densiflora</i>	Cho chi	Gerutu gerutu	2	
<i>Parashorea lucida</i>	Cho chi	Gerutu gerutu	2	
<i>Parashorea stellata</i>	Cho chi	Gerutu gerutu	2	
<i>Parinari ammanensis</i>	Cam	Merbatu	3	
<i>Parksia dongnaiensis</i>	Thui		4	
<i>Pasania spp.</i>	Bot, gie, soi		3	.68
<i>Pasania fissa</i>	Soi, bot	Mempening	3	
<i>Payena elliptica</i>	Viet	Nyatoh	3	.48
<i>Peltophorum dasyrrachi</i>	Lim xet	Jemerlang	3	.81
<i>Peltophorum ferrugineum</i>	Lim xet	Jemerlang	3	.90
<i>Pentace tonkinensis</i>	Nghien	Melunak	2	.90
<i>Pinus armandii</i>	Thong		1.10	
<i>Pinus dalatensis</i>	Thong			
<i>Pinus elliottii</i>	Thong			
<i>Pinus griffithii</i>	Thong			
<i>Pinus khasya</i>	Thong mu			
<i>Pinus krempfii</i>	Thong			
<i>Pinus massoniana</i>	Thong			
<i>Pinus merkusii</i>	Thong			
<i>Pinus patula</i>	Thong			

Continued--

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Podocarpus imbricatus</i>	Bach tung	Rempayan	3	
<i>Podocarpus latifolia</i>	Kim giao	Rempayan	3	
<i>Polyalthia</i> spp.	Ngan chay	Mempisang	4	
<i>Polyalthia jucunda</i>	Ten	Mempisang	4	
<i>Pometia pinnata</i>	Truong	Kasai	3	
<i>Pterocarya</i> spp.	Du		4	.90
<i>Pterocarya stenoptera</i>	Coi		4	
<i>Pterocarpus pedatus</i>	Dang huong	Sena	1	
<i>Pterospermum</i> spp.	Mang	Bayor	4	
<i>Pterospermum grewii</i>	Mang mang	Bayor	4	
<i>Pterospermum truncatolobatum</i>	Long mang	Bayor	4	
<i>Fygium arboreum</i>	Xoan dao, dao		3	
<i>Quercus</i> spp.	Bot, gie, soi		3	
<i>Rhizophora conjugata</i>	Duoc	Menpening	4	
<i>Rhizophora mucronata</i>	Dang	Bakau minyak	4	
<i>Samanea saman</i>	Me tray	Bakau kurap	4	1.05
<i>Sandoricum indicum</i>	Sau	Kungkur	4	1.05
<i>Sapindas mukorossi</i>	Xu	Sentul	4	
<i>Schima</i> spp.	Cho xot	Gegatal	4	
<i>Shorea</i> spp.	Bo bo	Balau	3	.56
<i>Shorea cochinchinensis</i>	Sen mu	Balau	2	.56
<i>Shorea hypochra</i>	Bo bo	Balau	3	.56
<i>Shorea obtusa</i>	Ca chak	Balau	2	.56
<i>Shorea talura</i>	Sen mu	Balau	3	.56
<i>Shorea vulgaris</i>	Chai	Balau	3	.56
<i>Sideroxylon eborneum</i>	May lai	Nyatoh	2	.56
<i>Sindora cochinchinensis</i>	Go mat	Sepetir	2	.56
<i>Sindora tonkinensis</i>	Gu -	Sepetir	2	.56
<i>Sonneratia acida</i>	Ban	Perepat	4	.56
<i>Spatholobus orientalis</i>	Rang rang		3	
<i>Spondias lutea</i>	Coc gao		4	
<i>Spondias mangifera</i>	Coc chua		4	
<i>Stenochlaena palustris</i>	Choai		4	

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera
and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
<i>Stenoptera</i> spp.	Tre	Kelumpang	4	
<i>Sterculia</i> spp.	Trom	Kelumpang	4	
<i>Sterculia lychnophora</i>	Voi	Kelumpang	4	
<i>Sterculia pexa</i>	Trom	Kelumpang	4	
<i>Stereospermum annamensis</i>	Ke	Chichnah	3	.90
<i>Styrax benzoin</i>	Bo de		4	.41
<i>Styrax tonkinensis</i>	Bo de		4	
<i>Swietenia macrophylla</i>	Giai ngua	Sentang	4	
<i>Symplocos laurina</i>	Dung		4	
<i>Talauma gioi</i>	Gioi	Chempaka	3	.55
<i>Tamarindus indica</i>	Me		4	
<i>Tarrietia cochinchinensis</i>	Huynh	Mengkrlang	3	.66
<i>Tarrietia littoralis</i>	Cui	Mengkrlang	4	
<i>Tectona grandis</i>	Gia ti	Teak	2	.65
<i>Terminalia</i> spp.	Chien lien	Jelawai	4	.85
<i>Terminalia catappa</i>	Chieu lieu	Jelawai	3	
<i>Terminalia chebula</i>	Chieu lieu	Jelawai	4	.91
<i>Terminalia tomentosa</i>	Cam lien	Jelawai	1	
<i>Tetrameles nudiflora</i>	Tung	Mengkundor	4	
<i>Toona febrifuga</i>	Xoan moc	Surlian	3	.55
<i>Vatica</i> spp.	Lau tau, la hop	Resak	3	.97
<i>Vatica tonkinensis</i>	Tau	Resak	2	.89
<i>Vitex pubescens</i>	Rinh linh	Leban	2	1.00
<i>Vitex sumatrana</i>	Hap	Leban	2	
<i>Wrightia annamensis</i>	Long muc		3	.43
<i>Xanthophyllum echin chinensis</i>	Sang da	Minyak berok	3	.87
<i>Xanthophyllum colybrium</i>	Sang da	Minyak berok	3	
<i>Xanthophyllum excelsum</i>	Thach luc	Minyak berok	4	
<i>Xerospermum macrophyllum</i>	Truong	Kasai	3	.90
<i>Xylia dolabriformis</i>	Cam xe		2	1.14
<i>Xylia kerrii</i>	Da da		2	.96
<i>Xylopia pierre</i>	Den	Mempisang	2	

Continued--

Appendix table 3.--Species native to Vietnam, arranged alphabetically by botanical genera and species--continued

Scientific name	Vietnamese common name	Malaysian common name	Use classification*	Specific gravity
Ca gang			4	
Dua cao			4	
Leo heo			4	
Luong tuong			4	
Mung			4	
Ngat			4	
No			4	
Phao Lai			4	
So dia			4	
Thoai			4	
Tim Lang			4	
Vo va			4	

*Use classification:

- (1) Luxury wood.
- (2) Durable construction.
- (3) Protected construction.
- (4) Light construction.

APPENDIX D--JAPAN TIMBER DEMAND AND SUPPLY STATISTICS

The data in the following tables were obtained from several different sources. While they all are in general agreement, there are minor variations that may appear to be discrepancies. These arise from differences in classifications, the manner of recording the data, and differences in sources.

Appendix table 4.--Japan: Timber demand and supply, 1968-1972

	:	:	:	:	:
	1968	1969	1970	1971	1972 (estimate)
<u>Thousand cubic meters</u> <u>(Roundwood equivalent)</u>					
Demand					
Lumber	: 58,981	59,534	62,009	59,801	60,890
Pulp	: 20,225	21,967	24,887	25,715	26,390
Plywood	: 8,912	10,597	13,059	13,362	13,800
Others	: 3,688	3,472	2,724	2,527	2,230
Total	: <u>91,806</u>	<u>95,570</u>	<u>102,679</u>	<u>101,405</u>	<u>103,310</u>
Supply					
Domestic timber logs	: 48,169	46,062	45,351	45,251	44,920
Forest land wood residue	: 794	755	890	713	710
Subtotal	: <u>48,963</u>	<u>46,817</u>	<u>46,241</u>	<u>45,966</u>	<u>45,630</u>
Imported timber					
Logs	: 33,039	38,265	43,281	43,909	45,120
Lumber	: 3,290	2,705	3,957	2,792	3,000
Chips	: 3,274	4,115	5,031	5,946	6,540
Pulp and pulpwood	: 2,995	3,257	3,509	2,472	2,670
Veneer and plywood	: 42	75	548	200	250
Others	: 203	336	112	120	100
Subtotal	: <u>42,843</u>	<u>48,753</u>	<u>56,438</u>	<u>55,439</u>	<u>57,680</u>
Total	: <u>91,806</u>	<u>95,570</u>	<u>102,679</u>	<u>101,405</u>	<u>103,310</u>

Source: Forestry Agency, Ministry of Agriculture and Forestry, Tokyo.

Appendix table 5.--Japan: Consumption of timber products,
by origin of material, 1960-1972

Year	Domestic		Imports				Total
	Logs	Other	Logs	Lumber	Pulpwood and pulp	Plywood & other	
	<u>Million cubic meters, roundwood equivalent</u>						
1960	48.52	.49	6.67	.21	.66	---	56.55
1961	49.89	.92	9.14	.79	.81	.02	61.57
1962	49.81	1.00	11.25	.90	1.00	---	63.96
1963	50.19	.93	13.40	1.25	1.98	.01	67.76
1964	50.68	.98	15.69	1.30	2.16	.02	70.83
1965	49.53	.84	16.72	1.12	2.04	.27	70.52
1966	51.02	.81	20.23	1.61	2.67	.53	76.87
1967	51.81	.93	26.25	2.61	2.84	1.51	85.95
1968	48.17	.79	33.04	3.29	3.00	3.52	91.81
1969	46.06	.76	38.27	2.71	3.26	4.52	95.58
1970	45.35	.89	43.28	3.96	3.51	5.69	102.68
1971	45.25	.71	43.91	2.79	2.47	6.28	101.41
Estimate 1972	44.92	.71	45.12	3.00	2.67	6.89	103.31

Source: Japan Supply and Demand of Timber and the Status of Timber Industry. September 1972, Forestry Agency, Ministry of Agriculture and Forestry, Tokyo.

Appendix table 6.--Japan: Consumption of logs for lumber and plywood, 1960-1972

Year	Conifer			Non-Conifer			Grand total
	Domestic logs	Imported logs	Total	Domestic logs	Imported logs	Total	
	<u>Million cubic meters</u>						
1960	37.1	1.6	38.7	11.5	5.1	16.6	55.3
1961	37.1	3.2	40.3	12.8	6.0	18.8	59.1
1962	35.9	4.4	40.3	13.9	6.9	20.8	61.1
1963	35.6	5.9	41.5	14.6	7.5	22.1	63.6
1964	35.6	7.2	42.8	15.1	8.5	23.6	66.4
1965	35.0	7.8	42.8	14.6	9.0	23.6	66.4
1966	34.9	9.7	44.6	16.1	10.5	26.6	71.2
1967	33.3	12.3	45.6	18.5	13.8	32.3	77.9
1968	30.1	16.5	46.6	18.1	14.5	32.6	79.2
1969	27.8	15.5	43.3	18.2	17.3	35.5	78.8
1970	26.8	18.4	45.2	18.6	19.8	38.4	83.6
1971	26.0	16.0	42.0	19.2	21.0	40.2	82.2
1972		19.8			21.3		

Source: 1960-1966--Demand and Supply of Lumber. Statistical Research Section, Ministry of Agriculture and Forestry. September 24, 1968.

1967-1972--Japan, Exports and Imports, Commodity by Country. Ministry of Finance. Published by Japan Tariff Association.

Appendix table 7.--Japan: Log imports by geographic origin, 1960-1972

Year	Logs for lumber and plywood products				Logs for : pulpwood		Grand total
	Asia	North America	Russia	Other	Total	Total	
1960	5.0	---	1.0	.6	6.6	.66	7.26
1961	6.0	1.2	1.3	.6	9.2	.81	10.01
1962	6.9	2.1	1.5	.8	11.3	1.01	12.31
1963	7.6	3.0	1.8	1.0	13.4	1.98	15.38
1964	8.5	3.9	2.0	1.3	15.7	2.16	17.86
1965	9.0	4.2	2.4	1.2	16.8	2.04	18.84
1966	10.5	5.1	3.1	1.5	20.2	2.67	22.87
1967	14.4	6.7	4.0	1.0	26.1	2.84	28.94
1968	15.4	8.8	5.0	1.8	31.0	3.00	34.00
1969	17.3	8.1	5.3	2.1	32.8	3.26	36.06
1970	19.6	10.2	6.2	2.2	38.2	3.51	41.71
1971	20.5	7.9	6.1	2.5	37.0	2.47	39.47
1972	21.1	10.7	6.8	2.5	41.4		

Source: Supply and Demand of Timber and the Status of Timber Industry, September 1972, Ministry of Agriculture and Forestry.

Appendix table 8.--Japan: Imports of Southeast Asia logs, 1967-1971

	1967	1968	1969	1970	1971
Philippines	7,042	7,110	7,855	7,543	5,701
Sabah	3,885	3,661	4,042	3,960	4,130
Sarawak	1,431	1,931	1,935	1,872	1,472
Malaya	245	130	168	188	148
Subtotal Malaysia	5,561	5,722	6,145	6,020	5,750
Indonesia	496	948	2,814	6,090	8,181
Other	245	256	376	584	627
Total	13,344	14,036	17,190	20,237	20,259

Source: Japan Lumber Importers Association.

Appendix table 9.--Japan: Lauan wood imports for lumber and plywood
by country of origin, 1961-1972 1/

Year				Malaysia			Other	Total
	Indonesia	Philippines	Sabah	Sarawak	Malaya			
<u>Million cubic meters</u>								
1961	Trace	3.81	1.64	.06	Trace	.04	5.55	
1962	Trace	4.46	1.81	.07	Trace	.03	6.37	
1963	.02	5.46	2.04	.18	.02	.08	7.80	
1964	.05	5.29	2.21	.24	.02	.06	7.87	
1965	.08	5.61	2.72	.34	.08	.02	8.85	
1966	.13	6.72	3.42	.69	.09	.05	11.10	
1967	.34	7.19	3.74	.88	.25	.07	12.47	
1968	.73	7.33	3.58	1.24	.13	.14	13.15	
1969	2.06	8.19	3.92	1.26	.17	.09	15.69	
1970	4.73	7.72	3.84	.98	.18	.19	17.64	
1971	6.99	6.15	4.11	.96	.28	.13	18.62	
1972	7.02	5.17	5.26	.93	.17	.11	18.66	
:								
:								

1/ Logs and rough lumber to be used for lumber and plywood.

Source: Supply and Demand of Timber and the Status of Timber Industry, September 1972.
Japan Forestry Agency.

Appendix table 10.--Japan: Non-conifer log imports for lumber
and plywood, by tree species, 1967-1972

Species or species groups	1967	1968	1969	1970	1971	1972
	<u>Cubic meters</u>					
Lauan and Apitong	12,305,526	13,024,308	15,533,994	17,403,090	18,404,812	18,512,986
Kwarin						
Tsuga						
Red Sandalwood	5,988	4,974	5,866	8,628	14,851	16,372
Rosewood						
Ebonywood						
Ebony with white streaks	2,615	4,123	3,729	5,069	6,556	11,409
Cottonwood						
Aspen	46,301	38,476	33,237	39,173	29,353	30,570
Kiri (Paulownia)	2,725	2,922	4,268	3,082	6,384	12,101
Lignum Vitae	1,109	1,622	1,374	1,840	2,236	375
Teak	6,772	4,800	5,599	9,692	15,552	29,846
Mahogany	58,696	9,436	5,099	1,469	3,949	10,011
Black walnut	8,823	9,482	23,761	15,561	9,433	13,174
Sandalwood	2,185	890	62	14	721	47
Other non-conifers	1,345,923	1,374,899	1,668,346	2,363,125	2,550,575	2,699,798
Total	13,786,663	14,475,922	17,285,335	19,850,743	21,044,422	21,336,689

1/ Logs and rough lumber to be used for lumber and plywood.

Source: Supply and Demand of Timber and the Status of Timber Industry. September 1972.

Appendix table 11.--Japan: Imports of lumber from Asian countries, 1967-1972

Year	Philippines	Indonesia	Malaya	Singapore	Thailand	Taiwan	Korea	Other	Total	<u>Cubic meters</u>	
										<u>Manufactured volumes not roundwood</u>	
1967	24,940	1,078	78	66,391	12,782	1,342	50,278	438	1,408	158,735	
1968	24,851	136	472	75,666	11,346	1,217	54,273	---	2,299	170,260	
1969	37,768	458	6,838	93,384	12,627	900	70,301	256	5,350	227,874	
1970	46,851	5,310	6,074	146,810	29,517	1,542	97,436	2,490	7,823	343,853	
1971	40,058	543	2,671	162,621	13,090	1,909	55,314	2,065	6,663	284,934	
1972	41,717	448	1,810	109,000	12,711	2,008	80,755	113,584	1,375	363,408	

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 12.--Japan: Imports of plywood and veneer sheets for plywood from Asian countries, 1967-1972

Year	Philippines	Indonesia	Malaya	Singapore	Taiwan	Korea	Other	Total	<u>Thousand square meter</u>	
1967	2,937	---	1,786	314	571	859	1,985	3	8,455	
1968	3,013	---	3,147	148	282	666	553	---	7,809	
1969	1,847	---	2,502	340	860	2,644	3,315	39	11,547	
1970	7,288	---	3,255	2,406	3,210	33,985	23,712	3,706	77,562	
1971	5,189	---	4,569	1,805	12,453	4,406	12,869	3,052	44,342	
1972	5,383	6	2,802	634	21,364	14,812	18,244	613	63,858	

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 13.--Japan: Domestic production and imports, logs and lumber, 1965-1971

Year	Logs			Lumber		
	Domestic logs	Foreign logs purchased for lumber	Total logs consumption for lumber production	Domestic lumber production	Lumber imports	Lumber exports
<u>Million cubic meters</u>						
1965	34.124	11.845	44.845	33.291	.968	.156
1966	34.450	14.318	47.558	35.633	1.214	.142
1967	33.572	19.219	51.240	38.407	1.981	.129
1968	31.301	24.390	54.274	40.342	2.537	.117
1969	28.890	27.939	55.824	41.730	2.066	.110
1970	27.362	30.690	56.929	42.127	3.011	.092
1971	26.325	31.503	56.648	41.806	2.129	.091

Appendix table 14.—Japan: Plywood production, exports and consumption, 1965-1971

Year	Quantity of ordinary plywood production on 4 mm basis	Quantity of secondary plywood processed	Plywood exportation			Net consumption including carryovers
			Imported log species: plywood	Domestic species: plywood	Total: plywood	
<u>1,000 square meters</u>						
1965	656,859	186,626	52,687	25,104	18,689	96,480
1966	775,360	235,515	44,592	25,366	24,379	94,337
1967	944,459	282,087	34,179	27,010	23,071	84,260
1968	1,185,640	315,040	44,797	33,900	27,488	106,185
1969	1,473,226	368,818	30,917	33,991	33,393	98,301
1970	1,764,449	490,700	20,891	30,455	29,241	80,587
1971	1,834,961	497,741	14,100	30,702	37,005	81,807
						2,250,895

Secondary processed includes melamine, polyester, printed, coated, fancy, laminate.

Source : Plywood Industry in Japan, 1971. Japan Plywood Manufacture Association.

Appendix table 15.--Japan: Forecasts of demand for Southeast Asian logs, by major use, 1972-1976

Material	Demand	1972	1973	1974	1975	1976
<u>Million cubic meters</u>						
Plywood	Estimated demand	12.5	13.0	13.4	13.8	14.3
	Comparison to the previous year	+2.2%	+4.0%	+3.3%	+3.2%	+3.2%
Sawn	Estimated demand	7.5	7.7	7.9	8.1	8.2
Lumber	Comparison to the previous year	-4.5%	+2.0%	+2.3%	+2.5%	+1.9%
Total	Estimated demand	20.0	20.6	21.2	21.9	22.5*
	Comparison to the previous year	-0.5%	+3.2%	+2.9%	+3.0%	+2.7%

Source: Japan Lumber Importers Association.

*This figure is now expected to be exceeded in 1973.

Appendix table 16.--Japan: End uses of Southeast Asian logs sawn into lumber

	1970		1971		1972	
	Total	Percent	Total	Percent	January thru August	
<u>Thousand cubic meters</u>						
Exportable Inch board	42.4	0.6	8,900	0.1	3,500	0.1
Furniture	1,333.7	17.3	1,272,600	16.1	807,300	15.5
Fittings	820.5	10.6	838,600	10.6	535,900	10.3
House Building	3,790.7	49.1	4,200,800	53.3	2,953,200	56.9
Vehicles	636.0	8.2	507,800	6.4	300,400	5.8
Ship Building	156.2	2.0	165,100	2.1	103,100	2.0
Others	939.2	12.2	896,900	11.4	486,800	9.4
Total	7,718.7	100.0	7,890,700	100.0	5,190,200	100.0

Source: Japan Lumber Importers Association.

Appendix table 17.--Japan: Value per cubic meter of imported logs, by species, 1965-1972

Species and Species Groups	1965	1966	1967	1968	1969	1970	1971	1972
	<u>U.S. \$ per cubic meter</u>							
Pulpwood								
Conifer	16.29	15.98	17.23	20.66	18.03	17.86	18.93	20.34
Pulpwood								
Broadleaf	16.21	14.83	16.56	17.78	16.23	16.18	18.86	18.04
Pinus	25.00	25.22	26.29	29.26	28.79	29.65	30.61	33.17
Sitka								
Spruce	46.15	48.78	48.25	51.33	58.63	56.77	56.68	63.29
Abies and								
Picea								
Except								
Sitka	27.15	27.14	29.59	35.67	35.11	36.03	34.67	36.35
Larix	21.15	18.91	21.55	24.57	24.39	24.79	24.96	26.06
Chamacyparis	61.07	68.22	89.68	85.43	88.01	84.61	91.96	104.08
Tsuga	34.10	35.83	37.61	40.68	45.57	46.87	46.87	52.45
Thuja	40.38	41.76	41.15	41.03	47.82	47.90	49.03	57.16
Pseudotsuga	35.28	36.73	39.17	40.83	46.28	48.06	46.53	52.30
Lauan and Apitong	26.61	28.79	30.57	30.07	30.24	31.82	32.40	30.95
Kwarin								
Red Sandalwood								
Rosewood	133.06	148.94	153.92	186.42	175.42	183.15	204.23	221.46
Ebony with								
White								
Streaks	97.64	163.11	218.42	226.45	211.11	234.51	228.44	287.60
Cottonwood								
Aspen	11.89	26.45	27.68	28.98	30.04	31.09	34.53	34.19
Kiri	55.31	73.49	83.22	89.91	119.55	126.43	158.07	200.40
Lignum								
Vitae	339.20	359.01	374.63	405.77	390.44	422.69	420.56	618.67
Teak	216.46	200.87	228.49	302.03	326.64	221.92	213.91	211.00
Mahogany	143.28	32.28	32.34	28.43	41.11	86.82	94.55	93.41
Black								
Walnut	407.02	56.08	465.67	525.68	397.97	371.62	375.81	405.47
Sandalwood	1,079.06	13.49	15.96	48.11	1,142.96	2,678.77	104.90	1,587.19

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance.
 Published by Japan Tariff Association.

Appendix table 18.--Japan: Value per cubic meter of imported lauan and apitong logs, by country of origin, 1967-1972

Country	1967	1968	1969	1970	1971	1972
U.S. \$ per cubic meter, c.i.f.						
Indonesia	24.94	25.24	28.30	29.66	30.74	30.43
Philippines	32.02	31.78	31.68	33.68	35.17	32.33
Sabah	29.34	29.53	29.80	32.00	32.43	31.33
Sarawak	26.89	26.83	25.91	27.59	27.97	25.74
Malaya	28.27	26.59	26.01	28.63	28.69	29.31
Bismark Is.	---	24.75	27.39	28.25	25.10	25.41
Burma	---	---	---	45.54	30.71	30.82
T. Newga	22.40	21.50	22.16	---	23.48	23.17
Brunqe	27.19	28.85	29.92	29.97	31.35	25.54
Solomon Is.	---	18.12	23.49	25.24	22.33	22.45
New Hebrides	---	---	---	61.46	56.71	---
Thailand	31.54	29.83	---	52.26	200.35	---
R. China	71.56	---	---	---	---	---
Singapore	25.64	22.48	27.53	26.91	---	48.74
Hong Kong	---	---	---	---	---	35.54

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 19.--Japan: Average domestic wholesale prices of South Sea logs, December 1969 - August 1972

Date	Species			U.S. \$ per cubic meter	
	Apitong	Lauan			
		Indonesia	Sabah		
December 1969	33.33	33.19	38.47	40.97	
January 1970	32.92	32.64	39.03	40.97	
February	34.17	32.92	39.31	41.67	
March	34.72	33.33	39.44	42.08	
April	34.86	31.67	39.86	42.36	
May	35.42	34.31	40.56	43.33	
June	35.56	34.44	41.11	43.47	
July	35.83	35.56	41.81	44.31	
August	35.56	35.56	41.39	44.31	
September	35.42	36.67	41.94	44.86	
October	35.56	36.67	42.22	44.86	
November	35.69	37.08	42.36	44.86	
December 1970	35.42	37.08	42.22	45.00	
January 1971	36.96	38.55	44.20	46.81	
February	36.96	38.70	44.20	46.67	
March	36.81	38.70	44.06	46.52	
April	36.66	38.41	43.77	46.38	
May	36.52	37.68	43.04	45.80	
June	35.65	36.38	42.32	44.93	
July	35.22	36.38	41.88	44.93	
August	34.35	36.38	41.59	44.35	
September	32.46	34.78	40.00	42.32	
October	31.16	32.32	37.97	40.43	
November	29.42	30.00	35.80	38.70	
December 1971	29.42	28.99	34.35	37.83	
January 1972	33.89	33.89	39.20	43.36	
February	34.22	34.39	39.53	43.52	
March	34.22	34.39	39.53	43.52	
April	34.22	35.05	39.37	43.36	
May	34.39	35.05	39.20	43.36	
June	34.05	34.55	39.20	43.19	
July	33.55	34.05	39.20	42.03	
August	34.05	33.39	39.20	41.69	

Source: Japan Lumber Importers Association.

Appendix table 20.—Japan: Monthly values of imported logs, 1971-1972

Year and Months	Lauan and Apitong			Boxwood			Sandalwood			Teak			Non-Conifer not especially classified			Pinus			Abies and Picea			Hemlock and other Tonga				
	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.	U.S. \$ per m ³	Index	c.i.f.		
Jan. 1971	35.14	100		156.39	100		166.50	100		28.18	100		31.05	100		37.11	100		49.39	-100		50.09	101.42			
	35.62	101.35		167.67	107.21		168.43	101.15		29.63	105.15		31.53	101.54		40.03	107.87		50.37	96.37		49.00	99.20			
	35.30	100.45		184.69	118.09		257.81	154.83		29.56	101.36		31.84	102.54		35.76	102.26		37.75	101.72		50.25	101.74			
	35.71	101.61		284.93	143.82		184.33	110.71		28.84	102.32		31.75	103.38		32.03	103.14		35.92	96.79		48.60	98.40			
	35.39	100.70		196.54	125.67		155.12	93.16		29.14	103.38		31.98	149.36		34.91	103.02		34.91	94.07		47.62	96.42			
	35.49	101.00		199.11	127.31		248.69	149.74		28.00	99.34		32.24	168.74		32.47	115.23		32.82	35.07		46.50	94.88			
	34.42	97.94		205.63	131.48		280.96	131.48		27.46	97.45		31.88	102.67		33.92	91.39		31.39	45.66		45.66	92.45			
	32.79	93.31		224.56	143.58		198.54	119.24		25.36	89.98		30.75	143.50		32.19	89.98		32.19	86.73		44.42	89.94			
	30.14	85.77		230.66	147.49		238.94	142.63		25.22	89.48		29.02	192.20		29.47	115.43		31.75	85.52		46.01	93.16			
	29.03	82.60		223.07	142.63		192.20	115.43		25.72	96.75		28.94	209.45		27.72	125.79		33.83	91.16		45.01	91.13			
	28.31	80.55		213.65	136.61		209.45	136.61		24.69	121.49		24.69	212.49		24.69	127.61		29.44	94.80		36.20	97.55			
	27.53	78.34		210.93	134.87																			45.21	91.54	
1971 Average	32.87	93.53	204.23	130.58	213.90	128.46	27.79	98.62	31.05	100.00	100.00	31.05	100.00	100.00	35.18	94.78	47.55	96.27								
	29.14	82.93	229.19	146.54	202.85	121.82	27.24	96.67	32.11	103.42	37.43	100.87	50.04	101.31												
	29.15	82.95	238.69	152.62	218.15	131.02	24.69	87.62	32.57	104.91	37.53	101.12	51.82	104.91												
	29.94	85.20	220.95	141.28	268.15	161.11	26.83	95.21	33.27	107.15	32.55	87.71	50.88	103.00												
	30.21	85.95	229.62	146.82	249.85	150.06	28.23	100.17	33.11	106.61	39.17	105.54	50.54	102.32												
	30.61	87.12	294.47	188.29	211.49	127.02	27.63	98.93	33.02	106.33	34.33	92.51	49.61	100.44												
	30.80	87.66	215.80	137.98	231.64	139.12	30.94	109.79	33.02	106.34	34.88	93.98	50.71	102.66												
	30.68	87.29	211.46	135.21	241.68	145.15	27.51	97.60	33.30	107.23	33.13	89.27	49.67	100.57												
	38.24	88.24	243.12	155.45	256.84	151.25	33.25	117.98	33.11	106.63	34.55	93.09	52.69	106.68												
	31.01	89.61	89.96	216.44	138.39	202.87	121.84	30.87	109.53	33.33	107.35	35.19	96.77	53.50	108.32											
	31.84	90.60	170.82	109.22	158.21	95.02	33.32	118.25	33.53	107.98	37.99	102.36	53.07	107.45												
	32.00	91.07	235.74	150.73	203.09	121.97	32.69	116.00	34.44	107.68	41.70	112.38	56.69	114.87												
	32.58	92.70	166.71	106.60	192.60	115.67					123.52	34.05	109.66	42.91	115.62											
1972 Average	30.95	88.08	221.46	141.61	211.00	126.73	29.96	106.33	33.17	106.83	36.35	97.95	52.45	106.20												

Appendix table 21.—Japan: Volume and value of lumber imports,
selected species, 1967-1972

		Cedars	:	Lauan, Keruing	:	Kiri	:	Teak
	Sitka	: White	:	Hemlock	:	Mersawa	:	(Paulownia)
	Spruce	: and	:			Dipterocarpaceae	:	
		Yellow	:				:	
Cubic meters (volume) and U.S. \$ per cubic meter, C.i.f. (Value)								
1967	Volume	449,105	99,430	905,869	106,062	3,417	1,999	
	Value	42.92	116.58	41.80	49.56	130.76	372.65	
1968	Volume	619,049	92,079	1,107,998	117,236	4,003	1,191	
	Value	41.71	141.51	45.96	52.25	145.55	368.33	
1969	Volume	531,577	123,274	855,614	146,133	4,487	2,421	
	Value	51.35	148.76	50.06	52.64	191.92	338.08	
1970	Volume	538,891	177,597	1,535,633	235,013	4,159	2,845	
	Value	53.71	160.09	47.39	56.21	181.31	317.41	
1971	Volume	451,349	98,762	903,911	212,199	6,199	3,528	
	Value	55.29	181.96	46.34	59.82	201.84	325.47	
1972	Volume	423,494	143,008	1,094,129	152,007	91,631	1,606	
	Value	67.56	182.52	54.98	65.41	54.89	279.39	

Appendix table 22.--Japan: Value per cubic meter of lauan, keruing, mersawa and other dipterocarpaceae lumber, by country of origin, 1967-1972

Country	1967	1968	1969	1970	1971	1972
<u>U.S. \$ per cubic meter</u>						
Malaya	49.53	53.50	55.18	58.24	60.80	64.96
Philippines	44.84	46.73	49.05	52.59	57.60	63.85
Rep. China	62.57	59.78	55.61	52.44	52.02	58.34
Ryukyu Is.	67.97	65.44	63.60	87.12	82.08	84.62
Singapore	50.21	50.75	52.20	55.85	59.55	65.03
Sabah	52.59	---	31.80	26.65	25.59	44.11
Rep. Korea	---	---	---	62.41	83.44	100.35
Indonesia	---	53.44	---	34.19	54.76	41.61
Burma	---	---	---	---	61.07	---
Sarawak	41.60	53.50	56.08	---	68.43	89.62
Brazil	---	---	---	---	169.96	---
USA	---	---	---	9.43	9.73	---
Thailand	86.65	84.51	---	---	---	91.23

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 23.--Japan: Volume and value per cubic meter of lauan, keruing, mersawa and other dipterocarpaceae lumber imported by months, 1971-1972

Year and month	Volume-cubic meters	U.S. \$ per cubic meter	Index
January 1971	15,062	58.84	100.00 1/
February	29,769	61.41	104.36
March	23,607	59.69	101.43
April	21,011	62.36	105.98
May	23,143	61.94	105.26
June	16,051	64.30	109.28
July	17,125	61.77	104.98
August	16,228	60.44	102.72
September	11,837	58.60	99.59
October	11,198	60.03	102.02
November	10,314	55.53	94.37
December	16,713	59.28	100.74
1971 (Total and average)	212,199	60.68	103.13
January 1972	9,821	64.68	109.92
February	7,007	64.50	109.61
March	8,512	62.88	106.86
April	8,952	64.80	110.12
May	9,807	62.69	106.55
June	8,578	64.31	109.29
July	17,933	62.66	106.48
August	13,607	67.04	113.94
September	13,456	66.05	112.25
October	18,309	66.59	113.16
November	13,331	67.50	114.71
December	22,694	67.43	114.60
1972 (Total and average)	152,007	65.41	111.17

1/ January 1971 = 100.

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 24.--Japan: Value and volume of sheets of veneer
for plywood from Southeast Asia, 1967-1972

Year	Quantity	U.S. \$ per square meter
<u>Thousand square meters</u>		
1967	5,339	0.1957
1968	6,479	0.2094
1969	5,429	0.2082
1970	14,550	0.1972
1971	23,636	0.1401
1972	29,840	0.1306

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance.
Published by Japan Tariff Association.

Appendix table 25.--Japan: Value and volume of plywood from Southeast Asia, by months, 1971-1972

Year and month	Quantity	U.S. \$ per square meter	Index
<u>Square meters</u>			
January 1971	1,271,323	.5472	100.00
February	1,182,274	.5060	92.47
March	2,112,312	.5157	94.24
April	944,179	.5308	97.00
May	921,347	.4887	89.30
June	1,021,200	.5374	98.20
July	785,459	.5025	91.83
August	870,515	.5187	94.79
September	1,508,411	.5199	95.01
October	1,522,933	.4420	80.77
November	566,421	.6071	110.94
December	1,011,573	.5487	100.27
1971 (Total and average)	13,717,938	.5165	94.38
January 1972	800,776	.5607	102.46
February	968,851	.6840	125.00
March	1,190,359	.5299	96.83
April	977,044	.4947	90.40
May	1,079,404	.5246	95.86
June	1,159,600	.4943	90.33
July	1,172,613	.6190	113.12
August	1,580,048	.7041	128.67
September	2,789,139	.6972	127.41
October	3,727,588	.7017	128.23
November	4,617,568	.5840	106.72
December	12,907,353	.5250	95.94
1972 (Total and average)	32,970,343	.5827	106.49

Base Index--January 1971 = 100.

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance.
Published by Japan Tariff Association.

Appendix table 26.--Japan: Value and volume of plywood from Southeast Asia, 1967-1972

Year	Quantity	U.S. \$ per M ²
Thousand square meters		
1967	2,927	.6571
1968	685	.6847
1969	6,035	.8822
1970	62,874	.4670
1971	13,718	.5165
1972	32,970	.5827

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

Appendix table 27.--Japan: Value and volume of sheets of veneer for plywood from Southeast Asia, by months, 1971-1972

Year and month	Thousand square meter quantity	U.S. \$ per square meter	Index of value
January 1971	1,346	0.2167	100.0
February	1,380	0.1945	89.75
March	1,788	0.2279	105.16
April	919	0.2084	96.16
May	1,261	0.2070	95.52
June	778	0.2493	115.04
July	592	0.2010	92.75
August	1,075	0.2091	96.49
September	1,584	0.2177	100.46
October	3,163	0.0826	38.11 (Mostly Singapore)
November	3,130	0.0824	38.02 " 1/
December	6,620	0.0741	34.19 " "
1971 (Total and average)	23,636	0.1401	64.65
January 1972	3,818	0.0988	45.59 (Mostly Singapore)
February	5,065	0.0864	39.87 " "
March	869	0.1105	50.99 (Singapore Vol.
April	4,427	0.1404	64.79 " Dropped)
May	1,161	0.1767	81.54 " "
June	411	0.2529	116.70 (No Singapore)
July	5,842	0.1203	55.51 (Mostly Singapore)
August	2,816	0.1254	57.86 " "
September	2,160	0.1200	55.37 " "
October	1,113	0.2211	102.03 (Little Singapore)
November	891	0.2164	99.86 " "
December	1,266	0.2376	109.64
1972 (Total and average)	29,840	0.1306	60.27

Base Index: January 1971.

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

1/ Values from Singapore are considerably lower than from other countries and the average value fluctuates considerably in relation to the volume shipped from Singapore.

Appendix table 28.—Japan: Wood chip imports, broadleaf and conifer, by country, 1967-1972

	1967	1968	1969	1970	1971	1972
	U.S. \$ per MT.					
	Quan- tity					
Conifer	1,000 M.T.					
USSR		1/				
Canada	1,083	22.33	2,990	19.39	3,289	20.55
USA					1,893	35.23
Australia					15	3,606
New Zealand			16	19.10	167	17.84
Total	1,083	22.33	3,006	19.39	3,466	20.43
Non Conifer						
Ryukyu			10	18.62	5	25.14
Korea					8	15.40
Malaya			151	17.43	286	18.98
Sarawak			42	20.14	134	21.06
Sabah					139	24.95
Australia						198
New Zealand					11	41.54
Others					27	25.37
Total	None	203	18.15	458	20.02	539
Combined Chip Total	1,083	22.33	3,210	19.31	3,925	20.38
					2,750	35.30
					3,797	38.72

Source: Japan Exports and Imports, Commodity by Country. Compiled by Ministry of Finance. Published by Japan Tariff Association.

1/ No quantities reported for 1968.

Appendix table 29.--Wholesale price indexes in Japan, January 1970-July 1973

Base Index: Average CY 1970 = 100

Year	Overall Price Index	Wood products total	Domestic logs	All imported logs	Boards			Squares			Imported logs		
					Processed lumber	Cedar	Pine	Cypress	Cedar	Pine	Cypress	Cypress	U.S.
1970 average	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1971	99.2	97.4	95.1	98.2	87.9	94.5	97.9	89.9	93.5	98.2	104.6	97.0	97.6
1972	100.0	108.3	102.3	96.2	90.5	114.5	114.7	106.4	115.9	118.8	135.7	135.7	135.7
January 1970	99.4	96.7	100.1	98.5	92.2	101.4	99.0	103.2	100.3	99.1	96.2	95.6	95.6
February	99.9	97.7	99.5	99.1	94.7	101.6	101.9	103.8	100.3	99.9	96.9	96.3	96.3
March	100.2	98.7	99.4	99.9	96.2	101.9	102.5	101.0	99.8	100.6	97.2	97.9	97.9
April	100.5	100.6	99.4	100.3	103.6	101.3	101.3	99.5	100.5	101.0	98.4	98.9	98.9
May	100.5	101.6	99.8	100.4	107.2	100.6	99.7	100.5	100.5	100.5	99.5	100.5	100.5
June	100.1	101.7	99.2	100.5	108.2	100.4	99.4	98.9	100.4	99.5	99.5	100.8	100.8
July	100.0	101.7	98.9	100.9	108.4	100.7	100.7	98.7	100.0	99.2	100.4	101.7	101.7
August	100.1	102.0	100.2	100.7	106.9	99.4	99.4	98.5	100.2	99.5	101.6	101.7	101.7
September	100.1	101.3	100.8	100.3	102.1	99.5	100.1	100.2	100.3	100.7	102.2	101.7	101.7
October	99.9	100.1	102.3	100.1	96.6	98.9	100.5	100.0	100.1	100.6	102.2	101.7	101.7
November	99.7	99.1	101.4	99.7	92.8	97.9	99.5	98.5	99.7	100.0	102.5	101.8	102.1
December	99.6	98.6	98.9	99.7	91.1	97.9	99.4	97.6	97.9	99.3	103.3	102.1	102.1
January 1971	99.4	98.2	98.4	99.7	90.6	97.9	98.5	97.6	96.7	99.0	103.2	102.3	102.3
February	99.2	97.9	97.5	100.1	89.6	97.9	99.9	96.8	95.2	97.9	102.6	103.5	103.5
March	99.1	97.9	95.7	100.2	89.8	97.9	100.6	95.8	95.0	98.2	102.5	103.6	103.6
April	99.5	97.7	94.2	99.8	90.2	95.8	98.2	94.0	93.4	96.5	100.9	103.5	103.5
May	99.6	97.3	93.8	99.1	89.8	93.5	97.0	93.5	90.5	95.1	100.3	100.3	100.3
June	99.4	96.4	92.8	96.5	88.1	91.3	94.9	92.1	89.6	95.1	100.0	100.0	100.0
July	99.5	95.4	92.7	96.1	85.0	90.8	93.3	89.9	85.8	94.6	99.9	98.7	98.7
August	99.7	97.2	94.1	96.4	87.9	92.2	96.3	91.8	87.4	96.6	102.9	94.9	94.9
September	99.3	98.0	95.8	99.5	88.3	93.5	98.0	92.7	88.0	97.9	108.8	94.5	94.5
October	98.8	97.6	96.0	99.3	85.7	94.3	98.7	92.9	87.8	99.5	111.5	91.6	91.6
November	98.6	97.4	95.6	96.5	83.9	94.8	98.9	92.9	85.9	104.0	111.4	85.4	85.4
December	98.6	97.7	94.4	95.1	85.9	94.0	99.7	92.4	83.7	103.6	111.4	82.7	82.7
January 1972	98.4	97.8	94.0	94.5	85.0	93.7	99.8	92.2	83.3	104.5	110.2	82.1	82.1
February	98.5	97.9	92.3	94.3	85.3	94.1	99.9	92.6	84.6	104.2	110.2	81.8	81.8
March	98.7	98.0	92.0	94.3	85.9	93.9	99.3	92.0	84.5	104.7	110.1	82.5	82.5
April	98.9	97.9	93.0	94.4	85.5	94.4	99.7	92.6	84.0	105.0	110.1	81.9	81.9
May	99.0	98.2	93.2	92.1	85.1	94.4	100.7	93.8	84.0	105.0	110.4	80.4	80.4
June	99.1	98.6	94.0	91.2	85.3	95.3	100.7	94.6	84.2	105.4	110.4	78.9	78.9
July	99.2	100.1	96.0	90.7	86.5	99.0	101.1	97.9	86.9	108.1	110.6	76.2	76.2
August	99.8	103.0	100.6	91.3	90.3	101.6	101.8	103.7	104.8	111.4	124.8	76.2	76.2
September	100.5	105.3	102.6	92.8	92.3	104.3	104.3	107.9	107.1	113.9	127.5	76.2	76.2
October	101.2	111.1	104.1	95.9	95.3	112.5	116.7	116.4	110.3	121.9	155.3	77.3	77.3
November	102.7	137.7	123.8	105.6	99.3	173.3	169.4	191.7	168.7	161.8	204.4	78.4	78.4
December	104.3	153.6	142.2	118.3	110.4	217.9	183.2	215.0	194.7	180.1	254.4	83.4	83.4
January 1973	105.9	153.0	139.7	137.1	128.1	199.6	165.0	192.6	173.5	176.5	293.9	100.3	100.3
February	107.6	159.1	139.8	151.3	184.7	161.4	190.8	167.8	179.0	173.1	338.2	127.4	127.4
March	109.6	158.4	135.1	154.4	156.0	164.1	158.1	174.6	156.0	173.1	364.8	133.6	133.6
April	110.2	151.2	133.4	141.7	146.8	146.1	144.1	159.3	154.1	163.7	334.6	118.5	118.5
May	111.2	149.2	133.0	134.0	141.1	146.2	146.2	158.5	155.5	164.5	325.5	109.9	109.9
June	112.6	146.3	133.5	130.6	127.3	149.2	147.0	161.0	156.0	166.0	294.6	103.3	103.3
July	114.8	148.0	136.9	134.6	129.4	150.1	145.9	162.2	172.1	164.4	290.2	108.1	108.1

APPENDIX E-EXPORT AND IMPORT STATISTICS FOR SINGAPORE, 1967-1971

Appendix table 30.--Singapore: Imports and exports of fuelwood, 1967-1971

		Volume			Value							
		1967	1968	1969	1970	1971	1968	1969	1970	1971	1970	1971
IMPORTS												
Total	65,820	42,135	30,903	38,000	32,080	226,413	155,054	107,591	125,712	101,951	3	3
West Malaysia	65,820	42,135	30,903	38,000	32,080	226,413	155,041	107,591	125,712	101,951	3	3
Formosa	-	-	-	-	-	-	-	-	-	-	-	-
Hong Kong	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-
West Malaysia	109	109	663	153	80	42	1,034	3,857	7,333	4,762	1,585	38
* <i>Negligible.</i>												
EXPORTS												
Total	-	-	-	-	-	-	-	-	-	-	-	-
Formosa	-	-	-	-	-	-	-	-	-	-	-	-
Hong Kong	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-
West Malaysia	109	109	560	18	21	31	1,034	5,451	1,454	71	47	12
* <i>Negligible.</i>												

Appendix table 31.--Singapore: Imports and exports of wood shell and nut charcoal, including charcoal dust

		Volume			Value								
		1967	1968	1969	1970	1971	1967	1968	1969	1970	1971	1970	1971
IMPORTS													
Total	10,939	12,721	9,984	3,397	7,896	220,996	214,846	184,303	142,369	165,366	17	21	
Australia	-	-	-	* <i>Neg.</i>	-	-	-	-	-	-	-	-	-
Formosa	-	5	-	1	2	-	1,629	-	25	25	-	-	-
Germany Fed. Rep.	-	-	* <i>Neg.</i>	4,504	4,382	3,310	22	135	-	-	-	-	-
Thailand	7,714	6,336	5,480	4,404	4,470	155,050	8	127,576	94,902	91,677	69,396	438	328
West Malaysia	3,271	6,371	-	-	-	-	84,051	89,089	50,336	66,259	23	21	
Hong Kong	-	-	* <i>Neg.</i>	-	-	-	-	-	-	-	13	15	
India	-	-	-	-	-	-	-	-	-	-	-	-	-
USA	-	-	-	-	-	114	-	42	-	-	-	-	-
Netherlands	-	-	-	-	-	-	-	-	-	-	30,069	-	-
EXPORTS													
Total	663	1,465	976	3,826	20,310	20,193	41,615	35,456	183,859	36	48	-	-
Brunei	-	-	* <i>Neg.</i>	-	-	-	4	-	-	-	-	-	-
Christmas Is.	4	3	3	30	303	233	203	203	28	36	-	-	1
Hong Kong	27	-	-	8	613	-	-	-	536	-	-	-	-
Japan	-	-	-	55	2,607	-	-	-	2,971	142,806	54	55	
Kuwait	-	-	1,328	114	-	-	-	27,457	3,257	-	-	-	-
Sabah	1	-	-	* <i>Neg.</i>	-	71	-	-	9	-	-	-	-
Sarawak	-	1	-	* <i>Neg.</i>	-	-	89	-	-	-	-	-	-
Thailand	-	-	* <i>Neg.</i>	-	-	-	13	7	-	-	-	-	-
** OC Middle East	-	-	20	-	-	-	-	1,036	1,036	52	-	-	-
West Malaysia	278	318	256	779	1,018	10,007	8,453	9,094	27,587	34,946	.35	34	
Iran	-	-	100	-	-	-	-	-	-	-	-	-	-
Iraq	70	338	777	-	-	-	1,750	11,296	2,304	-	-	-	-
USA	-	2	-	-	-	-	200	857	-	-	6,071	30	
Trucial Oman	40	-	-	-	-	-	-	3,089	-	-	-	-	-
Bahrain	100	-	-	-	-	-	-	3,589	-	-	-	-	-
Libya	150	-	-	-	-	-	-	-	-	-	-	-	-

**Negligible.* **Other countries.

Appendix table 32.--Singapore: Imports and exports of teak sawlogs and veneer logs, 1967-1971

	Volume	Value	Average unit value									
	1967	1968	1969	1970	1971	1967	1968	1969	1970	1971	1970	1971
--50 cubic foot tons*												
<u>IMPORTS</u>												
Total		92	558	632	1,994		11,104	51,916	212,131	856,730	336	430
Burma		92	535	632	1,984		11,104	47,289	212,131	850,099	336	428
Thailand		--	--	--	10		--	--	--	6,631	--	662
Others as percent of total		--	--	--	--		--	9	--	--	--	--
<u>EXPORTS</u>												
Total	76	2,061	223	12	261	10,518	168,839	30,141	1,143	75,673	95	289
Japan	76	121	--	12	--	10,518	18,681	--	1,143	--	95	--
Belgium-Luxembourg	--	--	19	--	--	--	--	4,110	--	--	--	--
Germany Fed. Rep.	--	--	39	--	--	--	--	8,378	--	--	--	--
Hong Kong	--	1,308	150	--	--	--	--	101,302	13,214	--	--	--
Israel	--	--	14	--	--	--	--	4,439	--	--	--	--
Thailand	--	632	--	--	--	--	--	48,855	--	--	--	--
Denmark	--	--	--	--	--	--	--	247	--	--	71,298	--
Formosa	--	--	--	--	--	--	--	14	--	--	4,375	288
Others as percent of total	--	--	--	--	--	--	--	--	--	--	307	--

*Not hoppus tons.

Appendix table 33.--Singapore: Imports and exports of ramin sawlogs and veneer logs, 1967-1971

	Volume	Value	Average unit value									
	1967	1968	1969	1970	1971	1967	1968	1969	1970	1971	1970	1971
--50 cubic foot tons*												
<u>IMPORTS</u>												
Total	--	38	43	--	43		1,243	1,501	--	2,288	--	53
Sarawak	--	--	43	--	43		--	--	--	2,288	--	53
W. Malaysia	--	38	43	--	--		1,243	1,501	--	--	--	--
<u>EXPORTS</u>												
Total	--	148	--	18	2		--	5,713	--	1,377	1,214	63
Australia	--	148	--	--	--		--	5,713	--	--	--	607
Denmark	--	--	--	18	2		--	--	1,377	1,214	--	607

*Not hoppus tons.

Appendix table 34.—Singapore: Imports and exports of non-conifer sawlogs and veneer logs, excluding teak and ramin, 1967-1971

	1967	1968	1969	1970	1971	1967	1968	1969	1970	1971	Value	Average unit value
	Volume					Value						
	*50 cubic foot tons					U.S. dollars						
<u>IMPORTS</u>												
Total	730,388	812,229	925,064	1,021,671	982,921	18,894,658	23,536,559	27,019,279	30,913,671	33,804,105	30	34
Burma	---	---	63	472	114	---	---	3,263	15,114	25	45	223
Canada	---	---	---	---	---	**Neg.	85	---	16,057	---	189	---
India	---	---	---	---	---	---	---	---	150	---	115	---
West Malaysia	730,004	811,911	924,738	1,021,114	982,692	18,877,586	23,513,265	26,993,958	30,882,074	33,762,836	30	31
Australia	---	---	1	2	---	---	---	1,780	---	---	---	---
Hong Kong	---	---	1	2	---	---	---	1,98	---	---	---	---
Japan	---	---	3	2	---	---	---	1,403	---	---	---	---
Thailand	---	11	50	205	---	99	2,980	3,324	4,03	4,78	127	127
Sabah	172	307	212	2	---	10,633	20,314	15,298	229	229	39	39
Sarawak	212	2	---	---	6,429	55	55	55	55	55	---	---
<u>EXPORTS</u>												
Total	9,573	6,689	17,258	10,680	724	231,424	222,718	521,763	420,941	122,391	39	169
Australia	116	132	---	50	50	3,233	4,260	1,129	4,64	4,64	29	29
Canada	---	---	55	21	3	---	---	---	4,91	2,057	22	22
Denmark	---	---	55	70	3	---	1,868	12,449	9,910	6,209	794	794
Germany Fed. Rep.	9,457	6,114	17,064	8,049	21	228,191	185,358	476,772	337,966	107,226	384	300
Japan	---	---	37	2,449	50	191	66,224	66,677	42	42	213	213
Korea Rep.	---	386	5	16	191	---	10,177	99	6,970	4,2	35	35
West Malaysia	---	57	97	---	---	22,905	30,575	57	57	57	---	---
Italy and San Marino	---	Neg.	---	---	---	---	18	---	---	---	---	---
Hong Kong	---	---	---	---	---	---	---	---	---	---	---	---
Others as percent of total	---	---	---	---	---	---	---	---	---	---	---	---

*Not hoppus tons. **Negligible.

Appendix table 35.—Singapore: Imports and exports of teak lumber, 1967-1971

	1967	1968	1969	1970	1971	1967	1968	1969	1970	1971	Value	Average unit value
	Volume					Value						
	*50 cubic foot tons					U.S. dollars						
<u>IMPORTS</u>												
Total	10,925	13,236	14,702	16,265	11,020	1,276,771	1,482,794	1,811,561	2,194,159	1,460,128	135	133
Burma	10,376	12,832	14,353	15,685	10,243	1,189,348	1,407,729	1,740,270	2,030,715	1,319,137	129	129
Thailand	543	403	342	522	771	85,522	74,886	70,766	158,677	140,911	304	304
West Malaysia	---	---	7	58	5	153	525	525	525	350	86	70
Hong Kong	---	---	1	---	---	---	179	---	---	---	---	---
Formosa	6	---	1	7	---	---	1,728	---	---	---	---	---
Bahrain	---	---	---	---	---	---	179	---	---	---	---	---
Denmark	---	---	---	---	---	---	---	---	---	---	---	---
Hong Kong	55	30	90	20	3,621	2,608	1,839	2,608	2,608	2,608	7,042	2,351
Japan	25	84	122	16	8,839	10,85	10,85	10,85	10,85	10,85	1,143	1,143
Sabah	---	Neg.	3	10	10	10	10	10	10	10	22,877	700
Sarawak	11	8	12	16	2,994	2,994	2,994	2,994	2,994	2,994	1,339	1,339
Sweden	---	---	66	25	25	25	25	25	25	25	4,367	4,367
United Kingdom	---	Neg.	49	198	212	151	12,611	14,611	14,611	14,611	14,611	225
OC Africa***	---	---	502	173	173	173	211,901	211,901	211,901	211,901	211,901	230
West Malaysia	167	318	336	257	214	26,099	37,945	52,899	52,899	52,899	52,899	619
Christmas Is.	---	Neg.	---	---	---	---	49	50	50	50	50	85
Cyprus	8	---	---	---	---	---	3,571	5,044	5,044	5,044	5,044	240
Germany Fed. Rep.	---	210	91	39	39	50	25,394	30,507	30,507	30,507	30,507	202
Mauritius	25	20	50	50	50	50	4,741	4,741	4,741	4,741	4,741	202
Others as percent of total	---	---	---	---	---	---	---	---	---	---	---	---
Not hoppus tons. ***Negligible. ****Other countries.	---	---	---	---	---	---	---	---	---	---	9	9

Appendix table 36.-- Singapore: Imports and exports non-conifer lumber, excluding teak and ramin, 1967-1971

		Volume								Value	Average unit value
		1967	1968	1969	1970	1971	1967	1968	1969	1970	1971
-*50 cubic foot tons											
IMPORTS											
Total	97,563	140,606	165,069	195,433	184,811	147	4,385,704	6,432,252	7,829,048	9,550,052	9,017,897
Burma	-	-	-	-	-	-	-	-	-	9,660	49
Formosa	80	35	63	60	34	19,606	13,148	12,594	11,422	11,422	127
Germany Fed. Rep.	-	-	-	6	6	-	-	284	1,090	9,764	281
Hong Kong	1	10	3	4	4	-	360	3,815	1,818	1,705	1,632
Sarawak	-	-	24	146	4	-	-	2,558	20,708	552	142
Thailand	11	53	50	100	65	3,383	13,774	12,610	16,653	19,153	138
West Malaysia	97,416	140,506	164,927	195,041	184,522	4,352,661	6,400,530	7,799,273	9,488,814	8,955,424	295
USA	-	3	2	-	32	1,293	585	-	-	6,794	49
Sabah	-	-	-	**Neg.	-	-	-	-	-	-	-
Others as percent of total	Neg.	-	-	-	-	-	Neg.	-	-	-	-
EXPORTS											
Total	304,587	383,435	491,262	494,743	427,378	17,527,445	23,957,015	32,728,899	34,510,706	26,935,761	70
Aden	15,266	14,983	10,948	10,841	22,938	636,345	648,102	472,418	518,661	117,363	48
Australia	21,667	21,538	25,917	30,238	17,365	1,395,380	1,514,938	1,835,849	2,216,823	1,252,236	51
Belgium-Luxembourg	6,254	10,496	22,783	12,337	3,236	481,228	852,160	1,853,190	2,311,388	231,388	55
France and Monaco	27,449	41,742	78,983	50,451	32,611	2,015,888	3,436,161	6,923,114	4,777,383	2,582,603	72
Iraq	7,650	12,114	9,119	6,382	5,500	288,264	468,354	352,003	274,643	245,176	45
Italy and San Marino	4,752	5,882	11,104	14,144	13,160	307,019	418,325	867,169	1,142,628	1,003,661	81
Japan	25,198	23,657	34,087	66,052	38,788	1,521,684	1,453,712	2,029,269	4,233,067	2,550,368	66
Netherlands	14,811	22,366	33,656	33,951	19,127	1,062,806	1,751,829	2,833,106	3,119,371	1,609,524	83
Reunion Island	-	-	11,951	10,590	-	-	-	-	599,892	548,768	52
Saudi Arabia	20,417	31,993	40,582	37,452	28,739	1,277,647	1,650,564	1,289,479	1,790,493	1,790,493	48
United Kingdom	32,347	42,654	41,392	40,468	23,482	1,924,022	2,666,871	2,527,858	2,734,418	1,661,271	68
USA	7,727	15,695	31,437	15,596	20,996	540,962	1,303,441	2,318,960	1,991,904	1,991,904	70
Mozambique	6,473	14,522	10,411	18,743	11,569	409,320	965,191	657,556	1,333,004	723,739	71
Trucial Oman	8,885	14,317	12,160	17,106	16,448	398,360	604,196	515,897	837,678	842,278	51
OC Africa***	6,521	8,846	71,739	87,042	73,158	282,957	387,277	4,291,445	6,164,176	4,689,417	71
Others as percent of total	-	33	27	11	-	31	26	11	9	16	-

*Not hoppus tons. **Negligible. ***Other countries.

Appendix table 37 .-- Singapore: Imports and exports of garroo wood chips, 1967-1971

Average unit value									
	1967	1968	1969	1970	1971	1968	1969	1970	1971
IMPORTS									
Total	56	160	177	164	131	137,374	138,741	167,301	133,422
Australia	2	5	5	5	19	105,751	1,871	1,625	814
Cambodia	34	55	74	58	116,400	116,400	146,381	92,179	725
Ceylon	Neg.	1	9	9	179	1,573	14,352	1,589	317
India	3	5	1	1	26	7,245	11,707	1,595	1,478
Sarawak	18	99	99	84	110	2,157	14,377	5,058	2,527
Thailand	1	Neg.	1	3	1	23,293	312	6,589	2,341
China	2	Neg.	---	---	4,239	214	4,970	9,731	1,707
Sabah	Neg.	---	---	---	1,693	143	---	78	89
Aden	Neg.	---	---	---	214	---	---	1,445	1,657
EXPORTS									
Total	91	77	79	61	537,124	489,898	470,353	307,818	5,954
Aden	7	10	8	5	69,606	60,723	32,454	56,207	56,207
Bahrain	1	2	3	2	15,693	23,604	17,939	17,854	11,380
China	28	36	31	35	24,354	156,811	182,517	39,575	8,543
Formosa	28	5	4	4	10,092	6,370	8,726	10,552	4,814
Hong Kong	1	3	15	19	6,468	67,891	52,561	2,187	2,021
Japan	---	---	---	---	---	886	11,737	64,131	2,192
Kenya	---	---	Neg.	1	---	5,925	5,925	11,737	15,737
Kuwait	9	10	8	5	309	408	546	569	569
Morocco	10	2	2	1	128,083	106,641	76,094	46,291	46,291
Saudi Arabia	3	2	3	4	40,232	37	54,452	26,516	9,512
Trucial Oman	---	---	1	Neg.	15,163	23,529	32,748	13,596	27,226
Thailand	---	1	---	---	231	5,884	579	8,187	8,187
West Malaysia	21	---	---	---	9,893	---	---	---	---
OC Middle East**	---	---	---	---	---	---	---	---	---
France and Monaco	2	Neg.	---	1	---	---	---	---	---

*Negligible. **Other countries.

Imports and exports of sandalwood chips, 1967-1971
Singapore: Appendix table 38 ::

*Negligible. **Other countries.

Appendix table 39.--Singapore: Imports and exports of plain plywood, 1967-1971

			Volume				Value		Average unit value	
	1967	1968	1969	1970	1971	1967	1968	1969	1970	1971
Imports										
Total										
Australia	48,460,087	79,900,607	108,450,150	107,759,282	125,930,211	2,767,468	4,539,385	5,691,643	5,600,088	6,479,117
China	157,276	15,240	---	130,321	400,568	9,485	1,040	6,284	6,284	.05
Formosa	16,040	172,080	220,998	137,520	2,021,332	1,444,450	10,019	8,493	8,867	.07
Japan	9,215	46,600	677,469	30,274	14,560	2,245	48,226	94,197	98,703	.07
United Kingdom	366	200	14,804	3,251	4,944	1,528	5,329	2,805	4,034	.15
West Malaysia	48,173,267	78,923,474	107,043,543	105,434,421	124,170,633	4,474,445	25	2,666	2,183	.36
Israel	49,022	38,400	8,600	---	---	---	5,593,160	5,484,949	6,348,350	.05
Italy & San Marino	54,900	704,613	445,644	---	---	4,397	2,821	3,037	---	---
USSR	---	---	---	---	---	45,707	34,095	---	---	---
Sabah	54,900	---	---	---	3,457	---	---	---	---	---
Exports										
Total	77,189,015	120,844,733	191,405,778	257,199,755	358,368,021	4,499,641	6,911,656	10,730,596	14,662,515	19,185,524
United Kingdom	28,921,389	52,354,632	76,719,753	115,674,745	113,528,759	1,993,730	3,295,859	4,620,080	6,725,019	6,522,338
Kuwait	8,948,116	11,013,431	12,560,559	14,590,775	12,366,476	428,780	522,048	653,021	909,647	.06
USA	9,415,327	21,160,911	35,841,048	12,541,428	54,128,169	459,639	1,146,673	1,870,650	2,891,448	.05
Japan	2,680,133	---	---	10,891,905	3,581,857	74,346	---	464,465	148,510	.04
Netherlands	370,240	495,080	4,632,642	9,340,048	13,324,177	20,827	25,111	213,638	412,550	.05
Trucial Oman	1,991,585	3,575,778	9,842,328	6,563,976	15,712,443	97,661	182,191	516,357	318,669	.04
Australia	476,836	216,659	560,443	5,196,148	4,569,033	28,843	14,137	29,552	239,492	.05
Iraq	---	107,820	657,993	3,243,105	3,719,422	---	4,553	27,855	311,426	.10
Canada	4,346,560	8,053,046	5,152,516	2,183,846	29,966	230,331	448,892	293,296	129,023	.06
Vietnam Rep.	4,042,726	2,325,810	5,058,138	9,115,218	106,040	243,589	138,238	285,612	398,989	.04
Kenya	1,123,499	2,924,514	4,539,207	11,070,079	71,464	50,035	174,989	268,843	610,063	.06
Saudi Arabia	152,100	344,202	4,807,774	5,198,753	15,355,617	13,105	16,636	223,574	247,328	613,431
France & Monaco	3,393,061	162,498	4,071,329	4,994,156	191,160	9,924	20,376	235,247	261,825	.06
Hong Kong	7,522,510	10,604,816	4,445,086	20,503,050	319,240	525,276	133,419	229,366	903,503	.04
Reunion Island	---	---	3,102,406	6,957,815	---	13	178,649	178,649	327,156	.05
Others as % of total	13	10	15	18	---	13	9	16	19	---

Appendix table 40 .-- Singapore: Imports and exports of veneered plywood panels, 1967-1971

		Volume								Value	Average unit value
		1967	1958	1969	1970	1971	1967	1968	1969	1970	1971
Imports											
Square feet--5 mm basis---											
Total		1,845,676	2,808,504	6,737,995	11,002,756	9,347,542	290,025	4,229,896	866,502	1,370,221	1,233,396
Australia		10,260	--	18,360	--	--	5,070	--	4,065	--	.13
China		--	520,980	693,360	699,780	--	--	29,687	43,708	48,636	.06
Christmas Is.		--	--	32	--	--	--	--	11	--	.07
Formosa		575,525	404,560	1,621,969	6,446,578	7,010,998	82,590	57,590	222,019	828,131	988,928
Germany Fed. Rep.		--	103,592	916	--	--	--	--	--	644	.14
Hong Kong		37,042	103,592	78,630	375	5,351	14,984	11,870	107	1,504	.70
Japan		1,227,879	2,231,064	2,926,634	2,150,252	603,388	200,343	347,987	500,415	405,402	126,586
USSR		--	--	345,629	--	--	--	--	27,037	--	.08
United Kingdom		--	53,757	30,701	5,905	2,666	--	3,124	1,265	1,264	2,085
USA		1,300	--	600	1,552,560	1,341,288	61	19,520	241	--	1,264
West Malaysia		--	--	--	--	989,178	--	--	66	97,674	59,593
Others as % of total		--	--	--	--	--	1	--	--	1	--
Exports											
Total		9,006,223	28,053,005	44,707,772	25,387,254	25,287,703	605,942	1,612,606	2,474,627	1,536,234	1,558,526
United Kingdom		3,279,725	9,236,690	25,082,718	13,575,542	7,844,528	223,109	3,532,167	1,313,002	800,263	512,977
Sabah		1,021,470	1,776,924	1,698,458	2,126,246	1,665,953	67,211	121,236	11,691	101,011	.06
Hong Kong		1,417,908	1,063,130	1,609,400	1,389,192	1,429,858	98,231	90,325	119,674	114,100	.08
Kenya		340,729	1,331,221	2,428,195	1,921,195	1,297,481	25,439	79,780	106,337	106,466	.06
Sarawak		825,823	1,077,563	1,329,892	1,293,318	57,671	71,043	89,513	66,014	77,935	.06
Brunei		536,761	571,663	823,680	859,170	963,125	34,397	36,182	45,563	52,551	61,124
Kuwait		--	2,077,280	1,243,840	861,200	2,853,000	--	109,170	63,664	47,314	151,876
Fiji		318,028	67,145	280,545	369,484	296,884	26,599	5,428	26,758	33,113	29,764
USA		274,014	7,943,576	6,979,773	512,000	3,421,640	13,693	432,812	340,084	26,579	165,927
West Malaysia		19,952	18,264	16,740	248,036	154,604	3,029	2,226	1,348	19,944	13,724
Netherlands		--	--	36,864	286,153	--	--	--	1,763	17,589	.06
Saudi Arabia		--	--	76,800	345,668	550,720	--	--	3,943	31,098	.06
Pakistan		--	--	579,211	389,383	399,696	--	--	26,022	16,711	.04
Canada		--	1,490,080	1,998,286	256,000	293,760	--	83,420	117,246	12,900	22,176
Tanzania		40,375	119,312	271,184	200,647	--	3,247	8,394	15,350	14,837	.05
Others as % of total		10	5	12	9	4	12	9	3	4	.05

Appendix table 41 .-- Singapore: Imports and exports of plywood faced with plastic, 1967-1971

	Volume	Value							Average unit value		
			1967	1968	1969	1970	1971	1967	1968	1969	1970
IMPORTS											
Total	566,684	676,608	694,794	1,415,342	503,774	166,541	154,629	139,510	287,475	106,836	.212
Formosa	146,150	3,205	47,206	132,918	142,320	14,161	5,273	7,266	117,786	25,805	.183
Japan	400,053	641,691	637,290	1,230,782	294,163	87,629	148,170	129,323	256,548	63,885	.217
United Kingdom	20,160	--	2,072	4,322	--	4,596	--	1,071	1,041	--	--
West Malaysia	320	1,613	7,596	47,320	65,611	154	427	1,850	12,100	11,293	.172
Hong Kong	--	1,254	--	--	--	759	--	--	--	--	--
Australia	--	--	--	--	1,680	--	--	--	--	5,853	3.48
Others as % of total	--	--	--	--	--	6	--	--	--	--	--
Square feet--5 mm basis											
Total	188,122	75,089	596,645	1,130,553	859,103	21,232	11,312	81,819	122,229	130,525	.152
Australia	--	--	33,414	81,052	44,674	--	--	6,437	15,720	8,574	.192
Brunei	1,038	2,700	3,268	2,120	--	103	529	741	321	--	.151
Sabah	2,022	1,280	--	2,304	2,892	290	171	--	229	572	.198
Portuguese Timor	--	--	--	1,280	--	--	--	--	274	--	--
United Kingdom	--	--	--	305,628	546,629	--	--	--	52,005	76,428	.140
USA	--	--	230,400	640,000	--	--	--	15,018	40,403	--	.063
OC West Europe *	--	--	230,400	13,216	57,408	--	--	--	2,307	9,160	.16
West Malaysia	185,062	63,322	94,399	84,953	166,560	20,839	9,244	13,226	10,970	30,131	.188
Cyprus	--	--	5,288	--	--	--	--	981	--	--	--
Iraq	--	--	185,760	--	--	--	--	36,151	--	--	--
Kuwait	--	--	25,232	--	--	--	--	4,687	--	--	--
Sarawak	--	7,288	11,908	--	2,095	--	1,368	2,247	--	748	.357
Trucial Oman	--	--	6,336	--	--	--	--	1,625	--	--	--
OC Africa *	--	--	640	--	--	31,820	--	107	--	--	.109
Others as % of total	--	--	--	--	--	--	--	--	3,473	--	--

*Other countries.

Appendix table 42.--Singapore: Imports and exports of wood flour, 1967-1971

	Value			
	1967	1968	1969	1970
<u>IMPORTS</u>				
Total	131,379	155,953	153,501	306,297
China	75,227	68,434	---	104,474
Formosa	---	---	---	787
France and Monaco	---	---	---	18
Hong Kong	13,219	25,134	23,031	48,717
India	152	764	885	367
Japan	761	1,198	---	4,921
Thailand	28,129	50,865	77,725	75,191
United Kingdom	9	321	361	430
West Malaysia	13,883	9,065	51,636	71,392
Switzerland	---	171	---	---
Australia	---	---	---	---
USA	---	---	---	---
<u>EXPORTS</u>				
Total	49,828	49,882	104,866	64,123
Brunei	---	---	---	21
Ghana	---	---	---	9,829
Hong Kong	---	---	357	161
Japan	---	48,843	101,273	714
West Malaysia	49,825	---	53,398	63,532
Formosa	---	---	3,214	---
Sarawak	3	11	21	805
Thailand	---	1,029	---	6,302
Ivory Coast	---	---	---	3,664

Appendix Table 43 .-- Singapore: Imports and exports of assembled boxes and cases of wood, except plywood, 1967-1971

		Volume				Value		Average unit value				
		1967	1968	1969	1970	1967	1968	1969	1970	1971	1970	1971
Number												
IMPORTS												
Total		24,526	141,282	172,356	18,228,786	30,829,131	11,216	54,366	86,539	130,351	126,880	.007
Australia		---	---	3	8	3	---	---	185	286	25	.004
China		200	497	18,000	600	30,600,000	63	875	296	10,533	17,141	8.33
Formosa		60	110	70	60	380	63	155	192	98	1,475	.0005
France and Monaco		---	---	---	1	6	---	---	---	21	100	3.88
Hong Kong		303	17	741	724	957	424	194	572	1,516	1,496	1.67
India		128	771	228	1,145	610	303	714	559	2,411	882	1.25
Japan	3,470	20,082	18,170	5,029	24,324,359	2,180	9,107	9,836	5,202	3,439	1,03	1.45
Thailand		33,010	77,430	73,550	93,760	---	12,622	30,167	33,005	42,004	815	0.14
United Kingdom		168	138	126	210	66	38	514	610	815	184	4.5
USA		---	28	---	153	6	---	104	---	217	160	2.79
West Malaysia		20,385	---	71,788	147,306	108,156	8,090	---	39,052	76,247	59,378	26.67
Germany Fed. Rep.		8	1	---	---	6	77	9	---	---	25	0.55
Sweden		3	---	---	---	---	36	---	---	---	725	---
Switzerland		---	---	---	---	819	---	---	---	---	---	---
Norway		1	---	---	---	5	---	---	---	---	---	---
EXPORTS												
Total		160,620	142,841	50,357	17,562	10,784	152,505	51,399	14,006	5,456	4,694	.44
Brunei		30	148	1,982	650	340	14	69	1,170	427	161	0.47
Sabah		1,578	1,269	460	558	4,146	430	199	199	240	891	0.21
United Kingdom		---	---	1	2	1	---	---	2	5	3	3.00
West Malaysia		156,780	141,418	46,633	16,352	5,876	151,539	51,039	12,108	4,785	3,444	0.59
Hong Kong		---	---	201	---	1	---	---	273	---	1	---
Sarawak		1,114	6	1,080	---	420	271	32	253	---	195	---

Appendix table 44.--Singapore: Imports and exports of builders' woodwork, including prefab sections, 1967-1971

			Value				
			1967	1968	1969	1970	1971
U.S. dollars							
IMPORTS							
Total	62,614	245,344	48,261	252,381	398,384		
Australia	96	161,907	4,369	4,468	20,525		
China	--	519	109	1,237	--		
Formosa	4,966	--	--	75,694	23,572		
Hong Kong	--	278	898	432	415		
India	--	--	--	175	--		
New Zealand	--	--	376	2,064	3,390		
United Kingdom	--	532	580	11,041	14,445		
USA	8,029	1,039	--	3,467	39,184		
West Malaysia	47,242	80,564	37,859	153,803	149,420		
Philippines	1,556	439	--	--	2,915		
France and Monaco	--	--	--	--	45		
Germany Fed. Rep.	--	--	--	--	821		
Japan	--	--	--	--	5,368		
Korea, Rep.	--	--	Neg.	8	9		
Others as % of total	*Neg.				2		
EXPORTS							
Total	155,190	328,622	322,396	208,424	207,140		
Australia	--	--	1,460	44,139	396		
Brunei	20,376	82,788	95,211	82,318	19,688		
Ceylon	--	--	--	286	--		
Christmas Is.	--	6,408	4,390	8,464	4,321		
Eire	--	--	--	1,786	--		
France and Monaco	45	--	--	321	813		
Germany Fed. Rep.	--	50	--	529	--		
Japan	70	--	70,548	16,086	4,625		
Sabah	6,495	2,741	3,813	868	3,977		
Sarawak	2,820	6,523	1,548	3,298	1,042		
United Kingdom	--	3,214	25,064	4,472	34,443		
USA	--	18,147	15,949	2,985	57,608		
Vietnam Rep.	109,549	198,339	80,140	40,324	59,628		
OC Africa	--	--	--	1,453	2,634		
West Malaysia	--	6,711	4,308	1,051	7,616		
Others as % of total	4				5		

*Negligible. **Other countries.

Appendix: table 45.--Singapore: Imports and exports of wooden household utensils, 1967-1971

				Value		
		1967	1968	1969	1970	1971
<u>U.S. dollars</u>						
IMPORTS						
Total		203,668	186,238	175,619	269,474	289,326
China		81,058	69,973	64,689	70,061	101,743
Czechoslovakia		23,543	17,582	10,070	36,121	21,789
Denmark		2,031	3,251	1,131	1,216	973
Formosa		6,225	5,892	6,551	24,401	27,732
Germany Fed. Rep.		814	460	184	3,513	26
Hong Kong		3,939	3,363	5,785	8,451	9,534
India		4,910	7,596	5,874	8,896	5,531
Italy and San Marino		331	531	1,283	6,668	1,182
Japan		67,460	53,741	52,306	64,004	65,081
Philippines		749	5,777	9,106	18,548	21,034
Sweden		683	1,196	---	735	1,016
Thailand		270	4,509	2,989	7,761	15,342
United Kingdom		4,853	225	2,573	5,586	5,221
USA		99	10,724	252	1,314	2,675
West Malaysia		5,320	---	11,426	10,621	9,879
Others as % of total		1	1	1	1	---
EXPORTS						
Total		87,090	87,090	51,884	44,418	56,507
Australia		875	1,073	2,777	752	215
Brunei		1,920	4,288	3,195	7,222	6,947
Canada		191	---	210	252	---
Germany Fed. Rep.		---	10	---	39	---
Hong Kong		1,005	1,019	785	690	961
Netherlands		---	26	4	27	19
New Guinea, Br.		71	103	100	106	13
Sabah		2,455	2,638	3,314	4,203	7,765
Portuguese Timor		755	---	---	27	69
Sarawak		3,953	5,151	6,471	5,777	9,383
USA		24	501	137	78	22
Papua		16	---	---	53	417
OC Africa *		---	---	466	143	120
OC Oceania		167	673	107	1,055	578
West Malaysia		69,597	46,365	32,436	23,884	23,362
Others as % of total		7	4	4	4	12

*Other countries.

Appendix table 46.---Sri Lanka: Imports and exports of ornamental woodenware, 1967-1971

				Value	
	1967	1968	1969	1970	1971
<u>IMPORTS</u>					
Total	281,529	392,646	215,471	329,344	444,468
Ceylon	10,471	15,480	15,308	15,890	19,054
China	136,421	244,215	71,483	95,960	113,167
Formosa	6,688	23,092	28,323	44,394	91,381
Germany Fed. Rep.	215	1,464	179	736	---
Hong Kong	19,990	21,354	19,315	23,990	35,307
India	22,326	15,758	10,095	28,406	26,029
Italy and San Marino	4,923	2,353	1,616	1,202	2,146
Japan	27,283	26,273	17,469	39,867	28,960
Kenya	6,841	3,510	5,806	1,359	2,350
Sabah	---	18	---	1,411	---
Philippines	32,213	24,836	25,946	34,832	59,386
Tanzania	---	---	959	2,675	5,564
Thailand	4,141	3,558	5,150	25,650	41,387
USA	74	---	2,600	754	1,998
West Malaysia	7,019	7,570	5,014	7,706	8,904
Others as % of total	1	1	3	2	15
<u>EXPORTS</u>					
Total	93,606	81,792	103,132	119,280	210,941
Australia	983	983	1,987	6,399	11,546
Belgium-Luxembourg	3,185	490	679	2,857	8,559
Brunei	1,096	2,168	630	3,663	4,735
Canada	1,348	1,040	1,651	2,990	3,636
Fiji	451	2,416	1,577	2,238	1,718
Germany, Fed. Rep.	67	2,830	2,722	3,270	6,633
Hong Kong	1,731	4,000	860	2,907	1,499
Italy and San Marino	598	10,254	4,547	5,103	14,341
Japan	7,806	6,955	9,839	21,949	37,454
Sabah	3,546	739	632	1,784	2,493
USA	8,436	10,709	24,155	14,685	39,224
Trucial Oman	---	---	---	1,234	557
OC Africa **	---	---	9,131	14,527	10,507
OC Oceania **	2,431	3,328	3,978	2,357	5,754
West Malaysia	42,707	24,178	25,749	22,755	31,567
Others as % of total	21	14	9	14	20

Appendix table 47.--Singapore: Imports and exports of other wood items, 1967-1971

	Value				
	1967	1968	1969	1970	1971
	U.S. dollars				
IMPORTS					
Total	436,734	483,110	545,089	592,258	742,089
Australia	764	5,051	4,35	5,796	11,900
China	60,350	78,884	83,857	69,449	44,808
Czechoslovakia	7,140	6,586	12,209	12,472	18,078
Formosa	5,480	3,166	7,196	6,782	12,523
France and Monaco	371	7,770	2,213	5,582	2,198
Germany Fed. Rep.	5,339	14,359	11,473	3,621	10,143
Hong Kong	21,874	29,818	25,516	35,122	29,088
India	2,548	8,510	4,748	9,002	3,078
Japan	103,468	76,245	74,195	90,634	97,432
Sweden	4,499	1,481	1,056	1,721	363
Switzerland	6,239	5,025	10,256	9,070	3,883
Thailand	6,239	20,842	46,404	39,023	6,992
United Kingdom	9,707	10,838	12,472	17,191	18,752
USA	4,038	5,850	3,646	5,450	15,829
West Malaysia	186,188	204,016	234,718	278,611	457,672
Others as % of total	3	1	3	1	1
EXPORTS					
Total	187,954	213,910	140,840	158,251	209,711
Australia	101	863	436	811	310
Brunei	9,893	13,352	10,533	15,580	14,462
Christmas Is.	98	380	11,515	15,479	7,178
France and Monaco	--	18	--	2,780	---
Hong Kong	19,170	1,771	3,616	1,660	906
Israel	--	--	100	15,375	---
Kuwait	--	--	--	607	1,029
Sabah	21,974	38,888	23,739	25,768	28,165
Sarawak	12,570	14,744	10,458	11,931	12,774
Thailand	573	1,214	3,516	958	71
USA	348	7,767	2,567	6,798	70,859
Vietnam Rep.	811	45,360	300	740	---
OC Africa **	--	--	1,644	3,309	1,853
OC Oceania **	48	354	133	1,029	38
West Malaysia	120,328	82,027	52,005	53,24	55,141
Others as % of total	1	3	11	1	6

*Negligible. **Other countries.

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